

# Exhibit E

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

GOOGLE LLC, CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS,  
VERIZON CORPORATE SERVICES GROUP INC.,  
T-MOBILE USA, INC., SPRINT LLC F/K/A SPRINT CORP.,  
AND AT&T SERVICES, INC.,

Petitioners,

v.

Headwater Research LLC,

Patent Owner.

---

Case: IPR2024-00943

U.S. Patent No. 8,589,541  
Issue Date: Nov. 19, 2013

Title: Device-Assisted Services for Protecting Network Capacity

---

**PETITION FOR *INTER PARTES* REVIEW**

## TABLE OF CONTENTS

|      |   |    |
|------|---|----|
| I.   | INTRODUCTION .....  | 1  |
| II.  | STANDING .....  | 1  |
| III. | RELIEF REQUESTED .....  | 1  |
| IV.  | THE '541 PATENT .....   | 1  |
|      | A.    Overview .....  | 1  |
|      | B.    Prosecution History .....   | 2  |
|      | C.    POSITA .....  | 2  |
| V.   | CLAIM CONSTRUCTION .....  | 3  |
| VI.  | PRIOR ART OVERVIEW .....  | 3  |
|      | A.    Rao.....  | 3  |
|      | B.    Fadell .....  | 4  |
|      | C.    Freund.....   | 6  |
| VII. | Ground 1: Rao-Fadell Renders Obvious Claims 1, 91-96, 99, 102-138, 140-152, and 158-159 ..... | 6  |
|      | A.    Motivation to Combine .....   | 6  |
|      | B.    Claim 1 .....   | 9  |
|      | C.    Claim 91 .....  | 28 |
|      | D.    Claim 92 .....  | 31 |
|      | E.    Claim 93 .....  | 33 |
|      | F.    Claim 94 .....  | 35 |
|      | G.    Claim 95 .....  | 38 |
|      | H.    Claim 96 .....  | 38 |

|     |                 |    |
|-----|-----------------|----|
| I.  | Claim 99 .....  | 39 |
| J.  | Claim 102 ..... | 40 |
| K.  | Claim 103 ..... | 41 |
| L.  | Claim 104 ..... | 42 |
| M.  | Claim 105 ..... | 43 |
| N.  | Claim 106 ..... | 46 |
| O.  | Claim 107 ..... | 47 |
| P.  | Claim 108 ..... | 48 |
| Q.  | Claim 109 ..... | 49 |
| R.  | Claim 110 ..... | 50 |
| S.  | Claim 111 ..... | 50 |
| T.  | Claim 112 ..... | 51 |
| U.  | Claim 113 ..... | 52 |
| V.  | Claim 114 ..... | 53 |
| W.  | Claim 115 ..... | 54 |
| X.  | Claim 116 ..... | 54 |
| Y.  | Claim 117 ..... | 56 |
| Z.  | Claim 118 ..... | 58 |
| AA. | Claim 119 ..... | 58 |
| BB. | Claim 120 ..... | 58 |
| CC. | Claim 121 ..... | 59 |
| DD. | Claim 122 ..... | 59 |
| EE. | Claim 123 ..... | 60 |

|      |                 |    |
|------|-----------------|----|
| FF.  | Claim 124 ..... | 60 |
| GG.  | Claim 125 ..... | 61 |
| HH.  | Claim 126 ..... | 61 |
| II.  | Claim 127 ..... | 61 |
| JJ.  | Claim 128 ..... | 61 |
| KK.  | Claim 129 ..... | 62 |
| LL.  | Claim 130 ..... | 63 |
| MM.  | Claim 131 ..... | 63 |
| NN.  | Claim 132 ..... | 63 |
| OO.  | Claim 133 ..... | 63 |
| PP.  | Claim 134 ..... | 64 |
| QQ.  | Claim 135 ..... | 64 |
| RR.  | Claim 136 ..... | 64 |
| SS.  | Claim 137 ..... | 65 |
| TT.  | Claim 138 ..... | 65 |
| UU.  | Claim 140 ..... | 66 |
| VV.  | Claim 141 ..... | 68 |
| WW.  | Claim 142 ..... | 69 |
| XX.  | Claim 143 ..... | 70 |
| YY.  | Claim 144 ..... | 70 |
| ZZ.  | Claim 145 ..... | 70 |
| AAA. | Claim 146 ..... | 70 |
| BBB. | Claim 147 ..... | 72 |

|   |    |
|---|----|
| CCC. Claim 148 .....  | 73 |
| DDD. Claim 149 .....  | 75 |
| EEE. Claim 150 .....  | 77 |
| FFF. Claim 151 .....  | 77 |
| GGG. Claim 152 .....  | 78 |
| HHH. Claim 158 .....  | 78 |
| III. Claim 159 .....  | 79 |
| VIII. Ground 2: Rao-Fadell-Freund Render Obvious Claims 97-98, 100-101, 139. .... | 79 |
| A. Motivation to Combine .....  | 79 |
| B. Claim 97 .....   | 81 |
| C. Claim 98 .....   | 83 |
| D. Claim 100 .....  | 84 |
| E. Claim 101 .....  | 85 |
| F. Claim 139 .....  | 86 |
| IX. 35 U.S.C. § 314.....  | 88 |
| X. 35 U.S.C. § 325.....   | 89 |
| XI. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8.....                                 | 90 |
| A. Real Party-in-Interest .....   | 90 |
| B. Related Matters.....   | 91 |
| C. Lead and Backup Counsel Information.....                                       | 91 |
| XII. CONCLUSION.....  | 93 |

## TABLE OF AUTHORITIES

### Cases

|   |    |
|---|----|
| <i>CoolIT Systems, Inc. v. Asetek Danmark A/S,<br/>IPR2021-01195, Paper 10 (PTAB Dec. 28, 2021)</i> ..... | 89 |
|---|----|

### Statutes

|                       |    |
|-----------------------|----|
| 35 U.S.C. § 314 ..... | 88 |
| 35 U.S.C. § 315 ..... | 91 |
| 35 U.S.C. § 325 ..... | 89 |

### Regulations

|                        |    |
|------------------------|----|
| 37 C.F.R. § 42.8 ..... | 90 |
|------------------------|----|

## LIST OF EXHIBITS

| Exhibit | Description   |
|---------|---|
| EX-1001 | U.S. Patent No. 8,589,541 (“the ’541 patent”)   |
| EX-1002 | U.S. Patent Publication No. 2006/0039354 to Rao et al. (“Rao”)  |
| EX-1003 | U.S. Patent Publication No. 2010/0017506 to Fadell (“Fadell”)   |
| EX-1004 | U.S. Patent No. 5,987,611 to Freund (“Freund”)  |
| EX-1005 | U.S. Patent No. 8,028,060 to Wyld et al. (“Wyld”)   |
| EX-1006 | File History of U.S. Patent No. 8,589,541 (Excerpted)   |
| EX-1007 | <i>Curriculum Vitae</i> of Andrew Wolfe   |
| EX-1008 | <i>Enable-ExchangeCertificate</i> , Microsoft, <a href="https://learn.microsoft.com/en-us/powershell/module/exchange/enable-exchangecertificate?view=exchange-ps">https://learn.microsoft.com/en-us/powershell/module/exchange/enable-exchangecertificate?view=exchange-ps</a> (last visited May 15, 2024)                                      |
| EX-1009 | Larry L. Peterson & Bruce S. Davie, <i>Computer Networks: A Systems Approach</i> (3d ed. 2003)  |
| EX-1010 | U.S. Patent Publication No. 2007/0038763 to Oestvall (“Oestvall”)   |
| EX-1011 | U.S. Patent Publication No. 2009/0207817 to Montemurro et al. (“Montemurro”)  |
| EX-1012 | Elizabeth Woyke, <i>World’s Most Wired Airports</i> , NBC News (Mar. 11, 2008, 10:02 AM), <a href="https://www.nbcnews.com/id/wbna23391922">https://www.nbcnews.com/id/wbna23391922</a> (last visited May 15, 2024)   |
| EX-1013 | <i>Madison Avenue Calling</i> , Gainesville Sun (Jan. 19, 2007, 11:00 PM), <a href="https://www.gainesville.com/story/news/2007/01/20/madison-avenue-calling/31509806007/">https://www.gainesville.com/story/news/2007/01/20/madison-avenue-calling/31509806007/</a> (last visited May 15, 2024)  |
| EX-1014 | Spyros Sakellariadis, <i>Using Exchange Server with SMTP and POP3</i> , ITPro Today (May 31, 1998), <a href="https://www.itprotoday.com/email-and-calendaring/using-exchange-server-smtp-and-pop3#close-modal">https://www.itprotoday.com/email-and-calendaring/using-exchange-server-smtp-and-pop3#close-modal</a> (last visited May 16, 2024) |
| EX-1015 | Declaration of Petitioner’s Expert, Andrew Wolfe (“Wolfe Declaration”)  |
| EX-1016 | U.S. Patent No. 8,914,783 to Van Camp (“Van Camp”)  |
| EX-1017 | Eastern District of Texas Model Order Focusing on Claim and Prior Art Reduction   |
| EX-1018 | Docket Control Order, <i>Headwater Research LLC v. Verizon Communications Inc.</i> , No. 2:23-cv-00352, ECF No. 40 (E.D. Tex. Oct. 24, 2023)  |
| EX-1019 | [Reserved]  |

| Exhibit | Description   |
|---------|---|
| EX-1020 | Defendants' Motion to Focus Patent Claims, <i>Headwater Research LLC v. AT&amp;T Services, Inc.</i> , No. 2:23-cv-00397, ECF No. 53 (E.D. Tex. Apr. 11, 2024)   |
| EX-1021 | Defendants' Motion for Entry of an Order Focusing Asserted Patent Claim and Prior Art, <i>Headwater Research LLC v. T-Mobile USA, Inc.</i> , No. 2:23-cv-00379, ECF No. 58 (E.D. Tex. Apr. 30, 2024)        |
| EX-1022 | Defendants' Motion for Entry of an Order Focusing Asserted Patent Claim and Prior Art, <i>Headwater Research LLC v. Verizon Communications Inc.</i> , No. 2:23-cv-00352, ECF No. 63 (E.D. Tex. May 1, 2024) |

## CLAIM LISTINGS

### **Independent Claim 1**

|             |   |
|-------------|---|
| <b>[1a]</b> | A non-transitory computer-readable storage medium storing machine-executable instructions that, when executed by one or more processors of a wireless end-user device, cause the one or more processors to:           |
| <b>[1b]</b> | identify a service usage activity of the wireless end-user device, the service usage activity being associated with a first software component of a plurality of software components on the wireless end user device, |
| <b>[1c]</b> | the service usage activity comprising one or more prospective or successful communications over a wireless network;   |
| <b>[1d]</b> | determine whether the service usage activity comprises a background activity;   |
| <b>[1e]</b> | determine at least an aspect of a policy based on a user input obtained through a user interface of the wireless end-user device or based on information from a network element,                                      |
| <b>[1f]</b> | the policy to be applied if the service usage activity is the background activity, the policy at least for controlling the service usage activity; and  |
| <b>[1g]</b> | if it is determined that the service usage activity is the background activity, apply the policy.   |

### **Dependent Claim 91**

|           |   |
|-----------|---|
| <b>91</b> | The non-transitory computer-readable storage medium recited in claim 1, wherein apply the policy comprises cause a notification to be presented through a user interface of the wireless end-user device. |
|-----------|---|

### **Dependent Claim 92**

|           |  |
|-----------|--|
| <b>92</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification provides information about the policy. |
|-----------|--|

### **Dependent Claim 93**

|           |  |
|-----------|--|
| <b>93</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification provides information about an option to set, control, override, or modify the at least an aspect of the policy or a second aspect of the policy. |
|-----------|--|

### **Dependent Claim 94**

|           |   |
|-----------|---|
| <b>94</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein, when executed by the one or more processors of the wireless end-user device, the machine-executable instructions further cause the one or more processors to obtain an indication of a user response to the notification. |
|-----------|---|

### **Dependent Claim 95**

|           |   |
|-----------|---|
| <b>95</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification provides a warning or an alert. |
|-----------|---|

### **Dependent Claim 96**

|           |  |
|-----------|--|
| <b>96</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification provides information about a service plan limit. |
|-----------|--|

### **Dependent Claim 97**

|           |  |
|-----------|--|
| <b>97</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the first software component is at least a portion of an application, and wherein the one or more prospective or successful communications over the wireless network comprise an attempt to launch, run, or execute the application, and wherein the notification comprises information about the attempt to launch, run, or execute the application. |
|-----------|--|

### **Dependent Claim 98**

|           |  |
|-----------|--|
| <b>98</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the one or more prospective or successful communications over the wireless network comprise an attempted or successful launch or execution of the first software component, and wherein the notification comprises information about the attempted or successful launch or execution of the first software component. |
|-----------|--|

## Dependent Claim 99

|           |  |
|-----------|--|
| <b>99</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the policy is based on a limit, and wherein, when executed by the one or more processors of the wireless end-user device, the machine-executable instructions further cause the one or more processors to determine that a data usage associated with the service usage activity is not less than the limit, and wherein cause a notification to be presented through a user interface of the wireless end-user device comprises trigger presentation of the notification based on the determination that the data usage associated with the service usage activity is not less than the limit. |
|-----------|--|

## Dependent Claim 100

|               |   |
|---------------|---|
| <b>[100a]</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the one or more prospective or successful communications over the wireless network comprise an attempt to download or load an application, and |
| <b>[100b]</b> | wherein the notification comprises information about the attempted download or load of the application.   |

## Dependent Claim 101

|            |  |
|------------|--|
| <b>101</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the one or more prospective or successful communications over the wireless network comprise an attempt to initiate usage of a cloud-based service or application, and wherein the notification comprises information about the attempted initiation of usage of the cloud-based service or application. |
|------------|--|

## Dependent Claim 102

|            |  |
|------------|--|
| <b>102</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification indicates that one or more service usage activities are subject to the policy. |
|------------|--|

### **Dependent Claim 103**

|            |  |
|------------|--|
| <b>103</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification provides information about a second network. |
|------------|--|

### **Dependent Claim 104**

|            |   |
|------------|---|
| <b>104</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification comprises an offer for a service plan upgrade or downgrade. |
|------------|---|

### **Dependent Claim 105**

|            |  |
|------------|--|
| <b>105</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein apply the policy further comprises obtain an indication of a user preference in response to the notification. |
|------------|--|

### **Dependent Claim 106**

|            |  |
|------------|--|
| <b>106</b> | The non-transitory computer-readable storage medium recited in claim 105, wherein the indication of the user preference comprises a user directive to associate the policy with a second software component. |
|------------|--|

### **Dependent Claim 107**

|            |  |
|------------|--|
| <b>107</b> | The non-transitory computer-readable storage medium recited in claim 105, wherein the indication of the user preference comprises a user directive to allow or block the service usage activity. |
|------------|--|

### **Dependent Claim 108**

|            |  |
|------------|--|
| <b>108</b> | The non-transitory computer-readable storage medium recited in claim 105, wherein the indication of the user preference identifies a traffic control setting associated with the policy. |
|------------|--|

### **Dependent Claim 109**

|            |   |
|------------|---|
| <b>109</b> | The non-transitory computer-readable storage medium recited in claim 105, wherein the indication of the user preference comprises a user directive to allow the service usage activity under a specified condition. |
|------------|---|

### **Dependent Claim 110**

|            |  |
|------------|--|
| <b>110</b> | The non-transitory computer-readable storage medium recited in claim 105, wherein the indication of the user preference comprises a user directive to override or modify the policy. |
|------------|--|

### **Dependent Claim 111**

|            |   |
|------------|---|
| <b>111</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein cause a notification to be presented through a user interface of the wireless end-user device comprises cause the notification to be presented based on occurrence of a trigger. |
|------------|---|

### **Dependent Claim 112**

|            |   |
|------------|---|
| <b>112</b> | The non-transitory computer-readable storage medium recited in claim 111, wherein the trigger is: a measure of the service usage activity satisfies a first condition relative to a threshold, an aspect of the service usage activity satisfies a second condition, a change to the policy, or a message from the network element. |
|------------|---|

### **Dependent Claim 113**

|            |  |
|------------|--|
| <b>113</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification enables a user associated with the wireless end-user device to obtain information about at least an aspect of the service usage activity or a service plan associated with the wireless end-user device. |
|------------|--|

### **Dependent Claim 114**

|            |   |
|------------|---|
| <b>114</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification presents a list of service usage activities or software components, the list of service usage activities or software components including the service usage activity or the first software component. |
|------------|---|

**Dependent Claim 115**

|            |  |
|------------|--|
| <b>115</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification presents an option to modify the policy. |
|------------|--|

**Dependent Claim 116**

|            |  |
|------------|--|
| <b>116</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification presents an indication of a measure of usage of the wireless network associated with the service usage activity. |
|------------|--|

**Dependent Claim 117**

|            |   |
|------------|---|
| <b>117</b> | The non-transitory computer-readable storage medium recited in claim 91, wherein the notification is provided through an e-mail, a text message, a window, a setting, or a voice message. |
|------------|---|

**Dependent Claim 118**

|            |  |
|------------|--|
| <b>118</b> | The non-transitory computer-readable storage medium recited in claim 1, wherein, when executed by the one or more processors of the wireless end-user device, the machine-executable instructions further cause the one or more processors to:<br><br>cause a notification to be presented through a user interface of the wireless end-user device. |
|------------|--|

**Dependent Claim 119**

|            |   |
|------------|---|
| <b>119</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification provides information about the policy. |
|------------|---|

**Dependent Claim 120**

|            |   |
|------------|---|
| <b>120</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification provides information about an option to set, control, override, or modify the at least an aspect of the policy or a second aspect of the policy. |
|------------|---|

## Dependent Claim 121

|            |  |
|------------|--|
| <b>121</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification indicates that the service usage activity is the background activity. |
|------------|--|

## Dependent Claim 122

|            |   |
|------------|---|
| <b>122</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification provides information about a second network. |
|------------|---|

## Dependent Claim 123

|            |  |
|------------|--|
| <b>123</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein, when executed by the one or more processors of the wireless end-user device, the machine-executable instructions further cause the one or more processors to obtain an indication of a user preference in response to the notification. |
|------------|--|

## Dependent Claim 124

|            |   |
|------------|---|
| <b>124</b> | The non-transitory computer-readable storage medium recited in claim 123, wherein the indication of the user preference comprises a user directive to associate the policy with the first software component. |
|------------|---|

## Dependent Claim 125

|            |   |
|------------|---|
| <b>125</b> | The non-transitory computer-readable storage medium recited in claim 123, wherein the indication of the user preference comprises a user directive to restrict, allow, or block the service usage activity. |
|------------|---|

## Dependent Claim 126

|            |  |
|------------|--|
| <b>126</b> | The non-transitory computer-readable storage medium recited in claim 123, wherein the indication of the user preference identifies a traffic control setting associated with the policy. |
|------------|--|

### **Dependent Claim 127**

|            |  |
|------------|--|
| <b>127</b> | The non-transitory computer-readable storage medium recited in claim 123, wherein the indication of the user preference comprises a user directive to override or modify the policy. |
|------------|--|

### **Dependent Claim 128**

|            |  |
|------------|--|
| <b>128</b> | The non-transitory computer-readable storage medium recited in claim 123, wherein the indication of the user preference comprises a user acknowledgment of the notification. |
|------------|--|

### **Dependent Claim 129**

|            |  |
|------------|--|
| <b>129</b> | The non-transitory computer-readable storage medium recited in claim 123, wherein the indication of the user preference indicates one or more network types. |
|------------|--|

### **Dependent Claim 130**

|            |  |
|------------|--|
| <b>130</b> | The non-transitory computer-readable storage medium recited in claim 129, wherein the one or more network types comprise WiFi, 4G, 3G, wireless, wired, or a combination of these. |
|------------|--|

### **Dependent Claim 131**

|            |  |
|------------|--|
| <b>131</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein cause a notification to be presented through a user interface of the wireless end-user device comprises cause the notification to be presented based on occurrence of a trigger. |
|------------|--|

### **Dependent Claim 132**

|            |   |
|------------|---|
| <b>132</b> | The non-transitory computer-readable storage medium recited in claim 131, wherein the trigger is: a measure of the service usage activity satisfies a first condition relative to a threshold, an aspect of the service usage activity satisfies a second condition, a change to the policy, or a message from the network element. |
|------------|---|

### **Dependent Claim 133**

|            |   |
|------------|---|
| <b>133</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification enables a user associated with the wireless end-user device to obtain information about at least an aspect of the service usage activity or a service plan associated with the wireless end-user device. |
|------------|---|

### **Dependent Claim 134**

|            |  |
|------------|--|
| <b>134</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents a list of service usage activities or software components, the list of service usage activities or software components including the service usage activity or the first software component. |
|------------|--|

### **Dependent Claim 135**

|            |   |
|------------|---|
| <b>135</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents information about a setting associated with the policy. |
|------------|---|

### **Dependent Claim 136**

|            |   |
|------------|---|
| <b>136</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents information about the wireless network. |
|------------|---|

### **Dependent Claim 137**

|            |   |
|------------|---|
| <b>137</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents an indication of a measure of usage of the wireless network associated with the service usage activity. |
|------------|---|

### **Dependent Claim 138**

|            |   |
|------------|---|
| <b>138</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents information about a network busy state or a network availability state. |
|------------|---|

### **Dependent Claim 139**

|            |   |
|------------|---|
| <b>139</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents an indication of a measure of usage of the wireless network associated with the first software component. |
|------------|---|

### **Dependent Claim 140**

|            |   |
|------------|---|
| <b>140</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification presents information about a statistic associated with the service usage activity. |
|------------|---|

### **Dependent Claim 141**

|            |  |
|------------|--|
| <b>141</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification comprises a gauge providing service usage information associated with the service usage activity. |
|------------|--|

### **Dependent Claim 142**

|            |   |
|------------|---|
| <b>142</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification comprises a gauge providing service usage information associated with one or more networks, the one or more networks including the wireless network. |
|------------|---|

### **Dependent Claim 143**

|            |  |
|------------|--|
| <b>143</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification comprises a gauge providing information associated with a service plan. |
|------------|--|

### **Dependent Claim 144**

|            |  |
|------------|--|
| <b>144</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification is provided through an e-mail, a text message, a window, a setting, or a voice message. |
|------------|--|

### **Dependent Claim 145**

|            |   |
|------------|---|
| <b>145</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification comprises a warning or an alert. |
|------------|---|

### **Dependent Claim 146**

|            |  |
|------------|--|
| <b>146</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the information from the network element is first information, and wherein the notification is based on second information from the network element. |
|------------|--|

### **Dependent Claim 147**

|            |   |
|------------|---|
| <b>147</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification comprises information about a cost or a charge associated with the service usage activity. |
|------------|---|

### **Dependent Claim 148**

|            |   |
|------------|---|
| <b>148</b> | The non-transitory computer-readable storage medium recited in claim 118, wherein the notification comprises information about a service sponsor. |
|------------|---|

### **Dependent Claim 149**

|            |   |
|------------|---|
| <b>149</b> | The non-transitory computer-readable storage medium recited in claim 1, wherein, when executed by the one or more processors of the wireless end-user device, the machine-executable instructions further cause the one or more processors to:<br><br>detect an attempted use of the first software component; and<br><br>based on the detected attempted use of the first software component, cause a notification to be presented through a user interface of the wireless end-user device. |
|------------|---|

### **Dependent Claim 150**

|            |   |
|------------|---|
| <b>150</b> | The non-transitory computer-readable storage medium recited in claim 149, wherein the notification provides information to enable a user associated with the wireless end-user device to override the policy. |
|------------|---|

### **Dependent Claim 151**

|            |  |
|------------|--|
| <b>151</b> | The non-transitory computer-readable storage medium recited in claim 149, wherein the notification provides information about a cost or a charge associated with the service usage activity. |
|------------|--|

### **Dependent Claim 152**

|            |   |
|------------|---|
| <b>152</b> | The non-transitory computer-readable storage medium recited in claim 149, wherein the notification provides information to enable a user associated with the wireless end-user device to change or upgrade a service plan associated with the wireless end-user device. |
|------------|---|

### **Dependent Claim 158**

|            |  |
|------------|--|
| <b>158</b> | The non-transitory computer-readable storage medium recited in claim 1, wherein the user input obtained through the user interface of the wireless end-user device specifies a user preference associated with the service usage activity or the first software component. |
|------------|--|

### **Dependent Claim 159**

|            |  |
|------------|--|
| <b>159</b> | The non-transitory computer-readable storage medium recited in claim 158, wherein the user preference comprises a preference to restrict, allow, block, delay, or throttle the service usage activity. |
|------------|--|

## I. INTRODUCTION

Petitioners request *inter partes* review (“IPR”) of claims 1, 91-152, and 158-159 of U.S. Patent No. 8,589,541.

## II. STANDING

Petitioners are not barred or estopped from requesting IPR on these grounds.

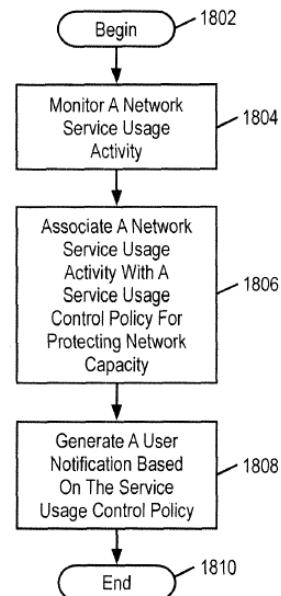
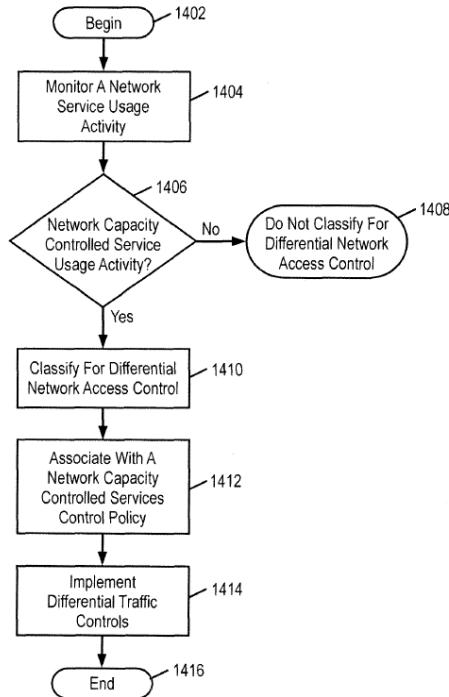
## III. RELIEF REQUESTED

| Grounds |   |
|---------|---|
| 1       | Rao in view of Fadell renders obvious claims 1, 91-96, 99, 102-138, 140-152, and 158-159. |
| 2       | Rao in view of Fadell and Freund renders obvious claims 97-98, 100-101, and 139.          |

## IV. THE ’541 PATENT

### A. Overview

The ’541 patent discloses “differentially controlling . . . network service usage activities” based on “the type of service activity requesting network access.” EX-1001, 15:13-18. A service usage control policy is applied “to protect network capacity.” *Id.*, 18:8-19:58. If a service usage activity is classified as a background activity, the control policy may assign it a priority. *Id.*, 18:8-20:43.



*Id.*, Figs. 14, 18.

## B. Prosecution History

The original claims were rejected. EX-1006, 192-214, 579-84. The applicant rewrote the independent claim and added 173 new dependent claims. *Id.*, 647-701. With an Examiner's amendment, the Examiner allowed all 174 claims. *Id.*, 744-56.

## C. POSITA

A POSITA at the time of the invention would have at least a bachelor's degree in computer science, computer engineering, or a similar field, and approximately two years of industry or academic experience in a field related to computer software development and/or computer networking. EX-1015 ¶¶50-52. Work experience can

substitute for education, and additional education can substitute for work experience.

*Id.*

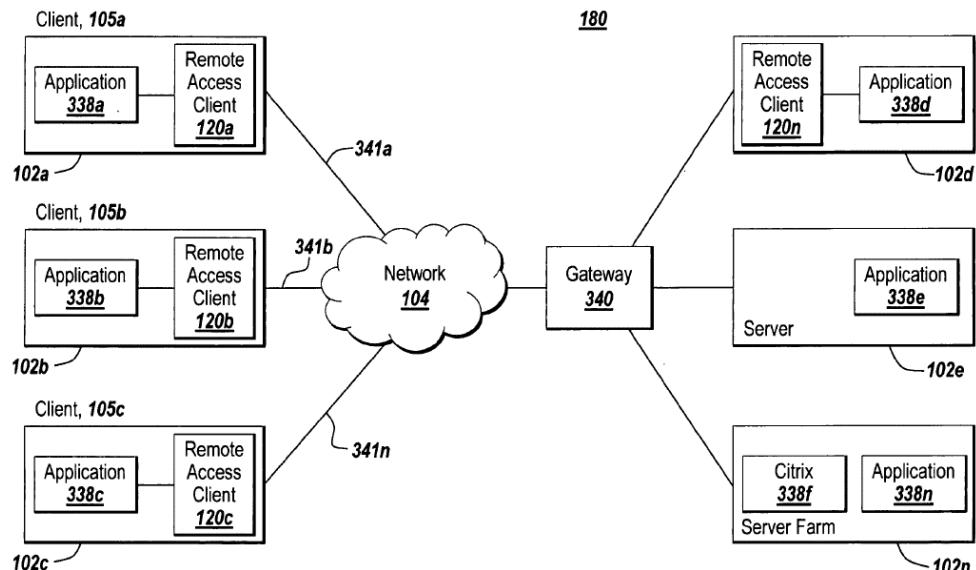
## V. CLAIM CONSTRUCTION

No terms require construction to resolve this Petition.

## VI. PRIOR ART OVERVIEW

### A. Rao

Rao discloses remote access client 120 that intercepts inbound or outbound network packets associated with applications of client 105. Rao ¶¶38-43, 99-110, 184-86. Intercepted packets are queued according to priority policies. *Id.* ¶¶38-46, 80, 184-94. Rao prioritizes by criteria, including by application and whether the application is “running in the foreground or the background.” *Id.* ¶¶182, 188-93.



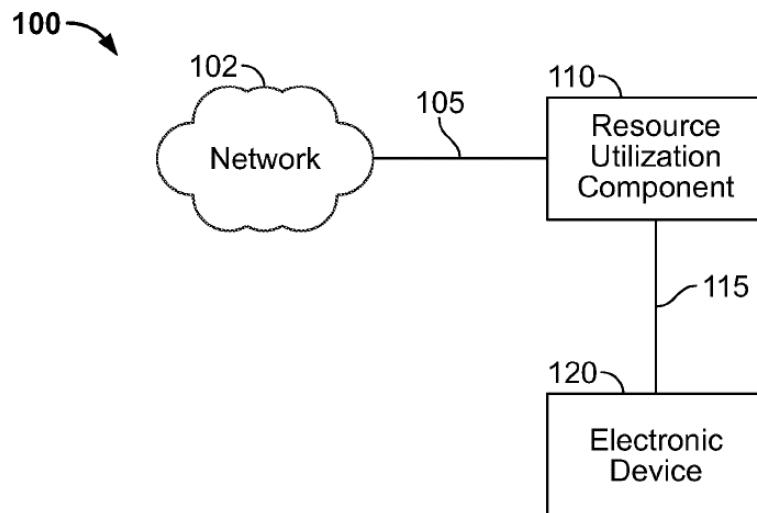
*Fig. 1A*

*Id.*, Fig. 1A.

Rao describes some of its disclosures as “embodiments,” but invites a POSITA to combine them. *Id.* ¶¶218-19; *id.* ¶¶74, 131. A POSITA would have therefore understood Rao to disclose various aspects of a single system. EX-1015 ¶¶56-59. A POSITA also would have been motivated and found it obvious to combine Rao’s “embodiments” in view of Rao’s express invitation and taught benefits. *Id.*

### B. Fadell

Fadell discloses controlling network usage. Fadell ¶¶16-17. Resource utilization component 110 monitors “utilization,” provides alerts, and “performs utilization shifting” to manage data/bandwidth consumption. *Id.*



**FIG. 1**

*Id.*, Fig. 1.

Fadell gives users notices, including the following, providing service plan information and options to purchase resources, limit use, and/or switch networks. *Id.* ¶¶17-29, 50-70.

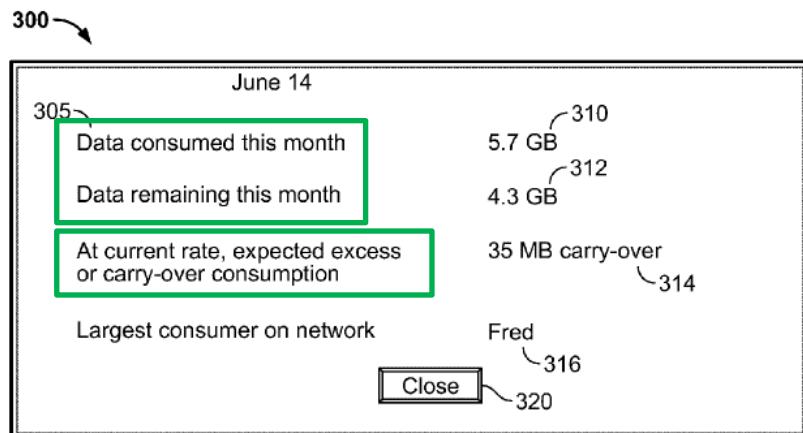


FIG. 3

*Id.*, Fig. 3 (annotated).

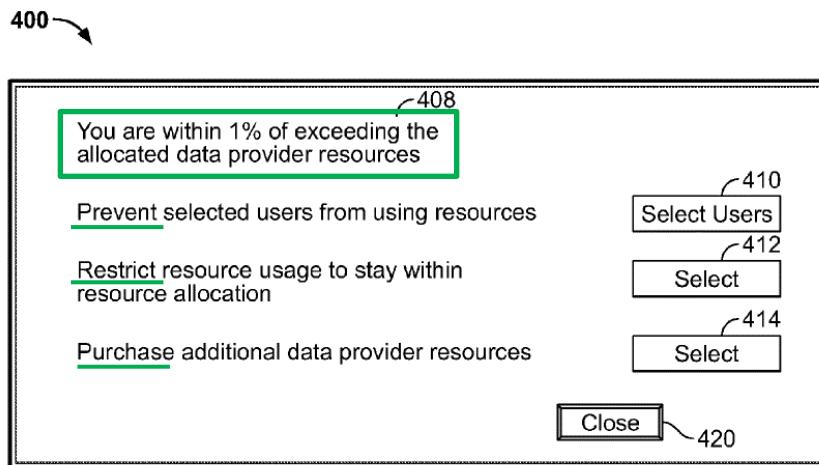


FIG. 4

*Id.*, Fig. 4 (annotated).

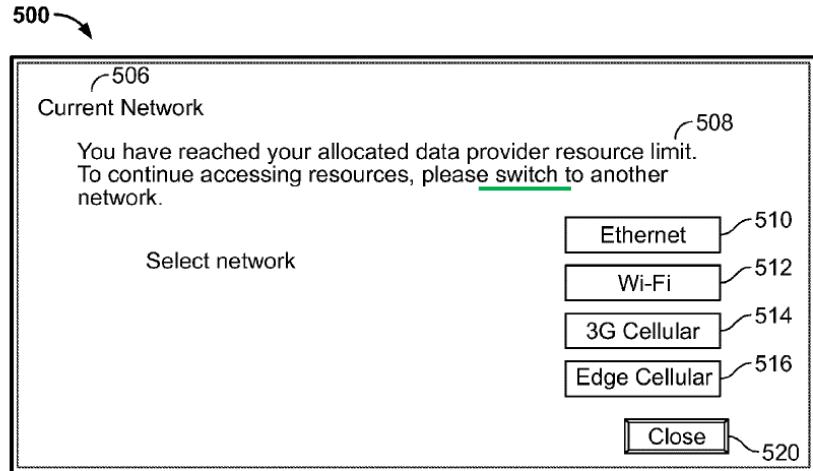


FIG. 5

*Id.*, Fig. 5 (annotated).

### C. Freund

Freund's client monitor application 311 intercepts, monitors, logs, and filters network communications associated with applications. Freund, 1:58-3:59, 13:23-15:30. Access rules with specified application criteria govern Internet access. *Id.*, 3:60-4:28. The monitor restricts rule-violating network traffic by, e.g. "denying Internet access" or "issu[ing] a warning." *Id.*, 4:26-5:64, 19:57-60, 21:12-20.

## VII. Ground 1: Rao-Fadell Renders Obvious Claims 1, 91-96, 99, 102-138, 140-152, and 158-159

### A. Motivation to Combine

It would have been obvious to combine Rao and Fadell, which disclose complementary methods for controlling network communications. EX-1015 ¶¶317-18; Rao ¶¶85-89, 97-105, 179-95, Figs. 5A-5B; Fadell ¶¶21-22, 47-72, Figs. 1, 3-6.

Like Rao’s “remote access client,” Fadell’s “resource utilization component” monitors resource usage and notifies users when usage reaches a limit to avoid penalties. Fadell ¶¶16, 21-27, 47-72, Figs. 1, 3-6. Fadell’s resource utilization component may enable, disable, cancel, delay, or reschedule network communications based on, e.g., importance, type of data transferred, associated application or protocol, and/or resources available. *Id.*; EX-1015 ¶¶319-20.

A POSITA would have looked to Fadell to improve Rao given their similarities and benefits. EX-1015 ¶¶321-22. The combined system would apply a prioritization to network packets from a background activity and notify a user when resource usage approaches a threshold. *Id.* When the threshold is met in Rao-Fadell, background activity network packets would be queued and deprioritized (Rao ¶¶180-95), and the user would be notified and given options to proceed (Fadell ¶¶47-72, Figs. 1, 3-6). EX-1015 ¶¶321-23. In one example, when a monthly data limit is reached, the policy would notify the user and cause the system to intercept/queue background activity (e.g., email, auto-updates, RSS feeds). *Id.*

A POSITA would have been motivated to combine the functionalities of Rao and Fadell (including, e.g., those associated with Rao’s remote access client and Fadell’s resource utilization component) to de-prioritize “low-priority” background activity, as both Rao and Fadell suggest, Rao ¶¶179, 182, 188-89, 192; Fadell ¶¶60, 64, 66, while providing the user information and options for how to proceed, as

Fadell suggests, Fadell ¶¶47-72, Figs. 1, 3-6; EX-1015 ¶323. This would have minimized data-coverage costs by rescheduling/delaying background activity near resource limits while providing the user with options for proceeding, e.g., by reducing resource usage, purchasing additional data, or switching networks. EX-1015 ¶¶323-26; Fadell ¶¶2-7, 16-18, 56-57, 63-65. Rao and Fadell both contemplate cellular use, and Rao’s prioritization would have benefited from Fadell’s usage limits and notifications in this “pay to use” context. EX-1015 ¶¶323-26; Rao ¶¶198, 130; Fadell ¶¶2-7, 16-18, 23, 42-46.

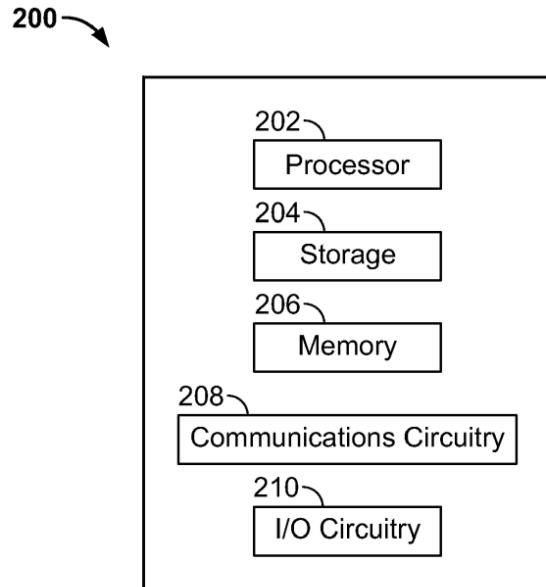
Combining Rao and Fadell would have been nothing more than the simple combination of known elements to obtain predictable results. EX-1015 ¶¶327-28. For example, the combination of Fadell’s resource usage thresholds and notifications with Rao’s prioritization techniques would have yielded the predictable result of a system that applies a prioritization of network packets associated with background activity and notifies the user when resource usage limits reach a threshold. *Id.* This also would have been nothing more than the use of the known techniques of monitoring resource usage limits and notifying the user to improve Rao in the same way and apply prioritization to background activity to avoid data overages. *Id.* A POSITA would have had a reasonable expectation of success in combining Rao with Fadell because both disclose monitoring network activity from handheld devices and mobile telephones and policies relating to associated network traffic. *Id.*

**B. Claim 1**

- 1. [1a] “A non-transitory computer-readable storage medium storing machine-executable instructions that, when executed by one or more processors of a wireless end-user device, cause the one or more processors to:”**

To the extent the preamble is limiting, Rao discloses “computing device 102” of client 105 (“wireless end-user device”) that includes a non-volatile “main memory unit” (“non-transitory computer-readable storage medium”) and a “central processing unit” (“one or more processors”). Rao ¶¶118-25, 99-100, 130, 79-116, 83-84, Figs. 1A-1E. Computing device 102 includes storage device 128 storing remote access client software 120. *Id.* ¶124, Fig. 1D. Rao’s memory and/or storage device stores instructions the CPU executes. *Id.* ¶¶116, 119, 124; EX-1015 ¶¶68-73.

Like Rao, Fadell’s wireless end-user device may include “a cellular telephone.” Fadell ¶¶29, 37. Fadell also discloses a “resource utilization component.” *Id.* ¶31; EX-1015 ¶¶329-32.



**FIG. 2**

Fadell, Fig. 2.

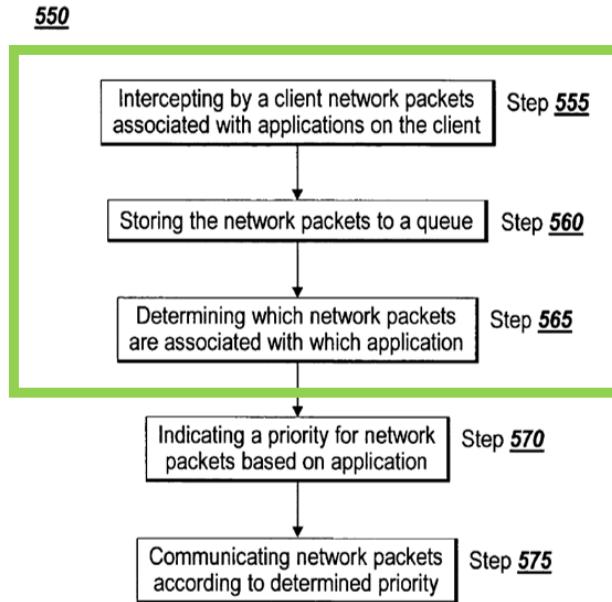
It would have been obvious to implement the Rao-Fadell device as a cellular phone or handheld computer that communicates over wireless (e.g., cellular) networks. *Id.* ¶¶29, 37. The Rao-Fadell device includes memory, storage, and a processor to execute stored instructions associated with the disclosed software/applications (e.g., Rao's remote access client 120 and/or Fadell's resource utilization component 110). EX-1015 ¶¶329-32. It would have been obvious to include functionalities associated with both Rao's remote access client 120 and Fadell's resource utilization component 110 in the combined instructions. *Id.* Rao explains that its policies are non-exclusive, Rao ¶182, and a POSITA would have

found it obvious to combine Rao's prioritization policies and Fadell's resource usage notification policies, EX-1015 ¶¶329-32; *supra* §VII.A.

2. [1b] "identify a service usage activity of the wireless end-user device, the service usage activity being associated with a first software component of a plurality of software components on the wireless end-user device,"

Rao discloses service usage activity: network packets communicated via network 104, which may be a wireless network. Rao ¶¶41-46, 52, 101-16; EX-1015 ¶¶74-75, 83; also EX-1001, 19:8-37. The network packets are associated with "a first software component" of many: "***one or more applications 338a-338n***, which access the network 104" and provide "real-time data communications." Rao ¶¶179-95, 87-91; EX-1015 ¶77. Each application is or includes a software component on the wireless end-user device. Rao ¶¶184, 188; EX-1015 ¶76.

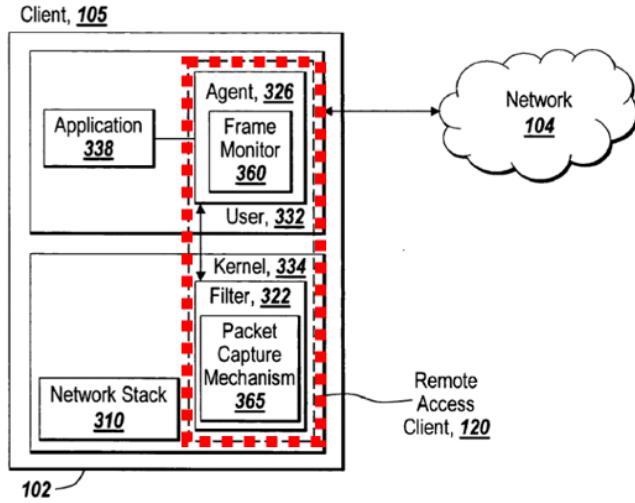
Rao discloses identifying a service usage activity associated with the software components because it teaches "intercepting" the network packets, "storing" the network packets, and "inspecting" the network packets to associate an application with the network packets. EX-1015 ¶78.



*Fig. 5B*

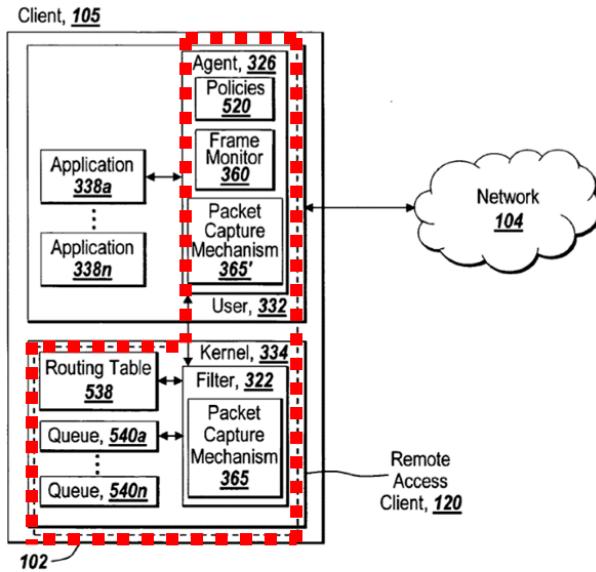
Rao, Fig. 5B (annotated).

Filter 322 “*intercept[s]* any of the network traffic . . . such as network packets associated with the application 338” to route the packets. *Id.* ¶¶99, 101-16, 179-81, Fig. 1C, 5A; EX-1015 ¶¶78-79.



*Fig. 1C*

Rao, Fig. 1C (annotating remote access client 120).



*Fig. 5A*

*Id.*, Fig. 5A (annotating remote access client 120).

Rao further *stores* intercepted packets in a queue, *id.* ¶¶186, 180-84, 191-93, Fig. 5C, and filter 322 “can *inspect* the contents of the packets” to, e.g., identify the

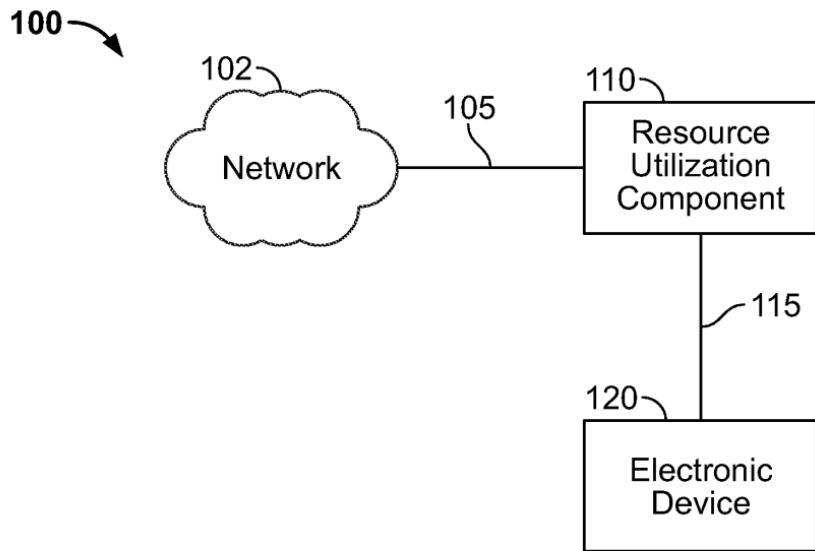
network or verify the application(s) that generated the packets, Rao ¶¶102-07, 186-87; EX-1015 ¶¶80-82. Based on this inspection, “agent 326 identifies the network packet as generated from an application 338a-338n by any of the content of the network packet” (e.g., “headers, fields, or the type and content of data”). Rao ¶187. Agent 326 may inspect the packet and “verify that the identified application actually generated the packet.” *Id.* ¶187; *id.* ¶¶105-09, 187. Agent 326 may associate the packet “with an application 338a-338n by matching information from the routing table 538.” *Id.* ¶187; EX-1015 ¶81. Rao teaches “indicating” a priority for the packets based on the associated application (step 570), confirming that they are identified as claimed. Rao, Fig. 5B; EX-1015 ¶82.

Intercepting, storing, and inspecting a network packet is (or requires) identifying the network packet; this understanding is consistent with the ’541 patent. *E.g.*, EX-1001, 69:5-35, 70:57-71:3, 72:22-28, 87:54-65, 96:66-97:54, Figs. 14, 18, claims 8, 17 (describing similar activities, e.g., “packet inspection” as “identifying”); EX-1015 ¶82.

Like Rao, Fadell discloses data transfers to/from device 120 via wireless network 102 (“service usage activity of the wireless end-user device”). Fadell ¶¶17-22, 26-32, 46-47, 62, 71-72.

Like Rao, Fadell identifies service usage activity. To monitor and limit resource usage, Fadell’s resource utilization component “identif[ies]” data requests

and/or transfers (service usage activity). EX-1015 ¶¶333-37. This includes associating data requests and/or transfers with data types, applications, and/or protocols. Fadell ¶¶18, 56, 59-61, 64.



**FIG. 1**

*Id.*, Fig. 1.

Given these teachings, a POSITA would have been motivated to implement functionalities from both Rao's remote access client 120 and Fadell's resource utilization component 110 in the combined instructions to identify service usage activity in order to implement the Rao-Fadell policy. EX-1015 ¶¶333-37; *supra* §VII.A.

3. [1c] “the service usage activity comprising one or more prospective or successful communications over a wireless network;”

Rao’s network packets disclose “service usage activity comprising . . . communications over a wireless network.”

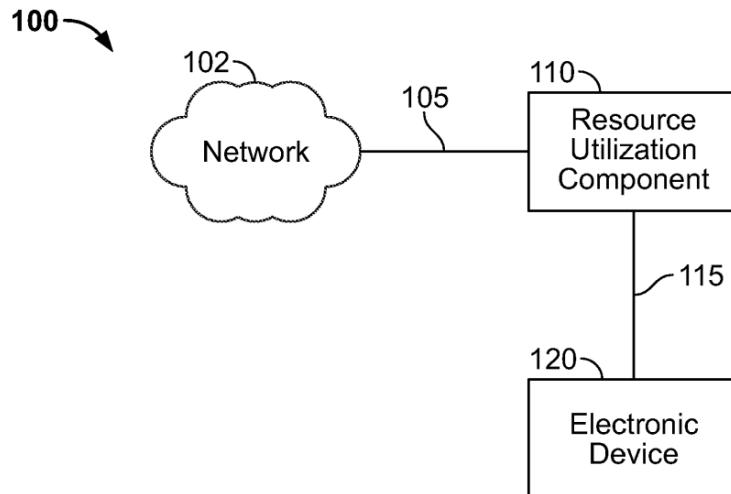
Remote access client 120 intercepts in-and-outbound network traffic associated with applications 338a-338n of client 105, which is “connected to network 104.” Rao ¶¶110, 179-80, 185 (“obtain inbound and/or outbound packets of the client 105, such as the network traffic associated with application 338”); *id.* ¶¶125, 195 (describing wireless interfaces/connections).

Rao’s intercepting, inspecting, and/or storing packets in queues *before* communicating them from the queues discloses identifying one or more *prospective* communications. *Id.* ¶¶184-86, 105, 110-11, 180, 194-95; EX-1015 ¶¶84-86.

Intercepting “inbound . . . [packets] . . . associated with application 338” discloses identifying one or more *successful* communications over a wireless network. Rao ¶184; EX-1015 ¶86. Communicating outbound network packets from the queues also discloses successful communications. Rao ¶¶189-95, Figs. 1A-C, 5A; EX-1015 ¶86.

Like Rao, Fadell discloses that “[e]lectronic device 120 may connect to network 102 using . . . any suitable wired or wireless communications path.” Fadell ¶28; EX-1015 ¶¶338-41. Fadell discloses that communications between electronic

devices 120 and network 102 may be routed through its resource utilization component, the functionality of which would have been incorporated with that of Rao's remote access client in Rao-Fadell. Fadell ¶¶27-28; *supra* §VII.A.



**FIG. 1**

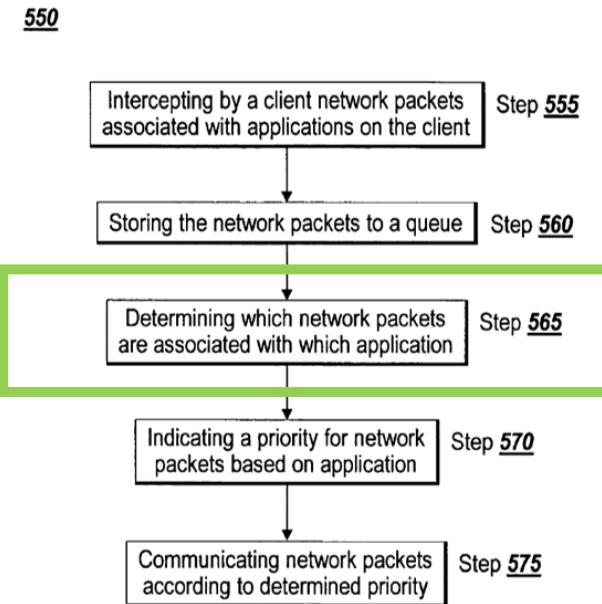
Fadell, Fig. 1.

Fadell's resource utilization component monitoring device data requests and/or transfers to or from network 102 (service usage activity) discloses identifying service usage activity comprising prospective or successful communications over the wireless network. *Id.* ¶¶24-28, 46-47; EX-1015 ¶¶338-41.

**4. [1d] “determine whether the service usage activity comprises a background activity;”**

After intercepting, Rao's remote access client 120 “*determines* the association of network packets with applications 338a-338n in order to determine priorities and apply any priority based policies 520.” Rao ¶187; EX-1015 ¶87. This includes

“*determin[ing]* whether the application 338a-338n associated with the network packet is running in the foreground or the background of the client 105.” Rao ¶¶188, 38-41, 182. This determination is made during step 565, when network packets are associated with an application. *Id.* ¶¶187-88; EX-1015 ¶¶87-88.



*Fig. 5B*

Rao, Fig. 5B (annotated).

By determining whether network packets are associated with an application “running in the background,” Rao determines whether the associated service usage activity “comprises a background activity,” *id.* ¶¶41, 188, and therefore determines whether the service usage activity associated with a first software component comprises a background activity, EX-1015 ¶89.

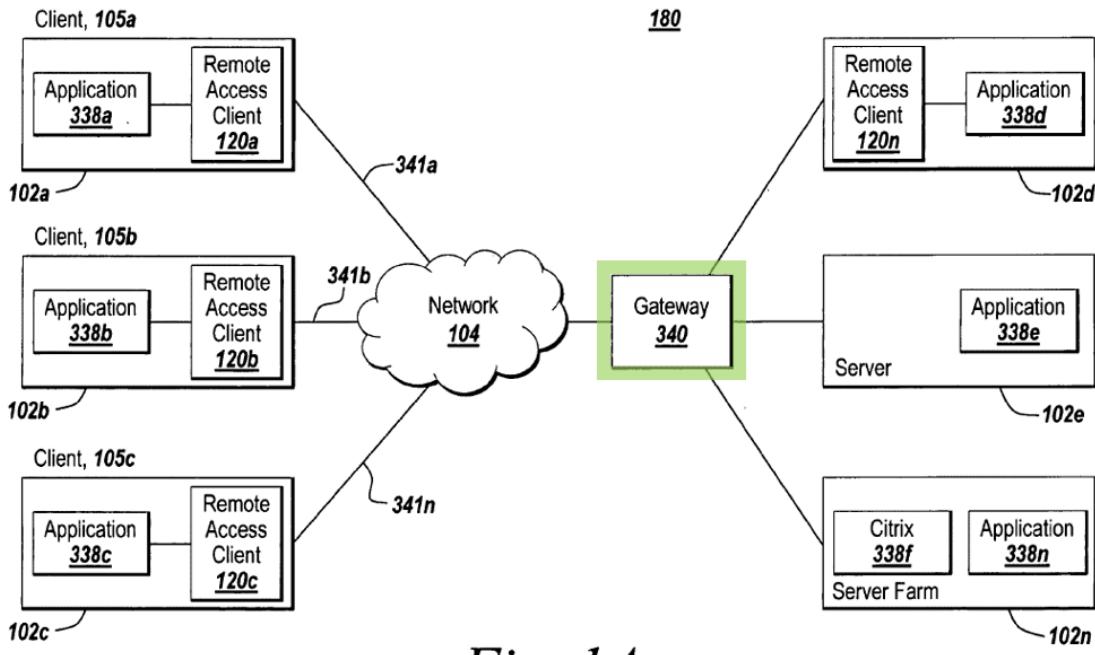
Determining whether an activity is a background activity was well known, as Rao discloses, and the methodology for making that determination would have been a simple design choice among finite, known options, for which a POSITA would have had a reasonable expectation of success. *Id.* ¶90.

Rao's teachings would have been implemented in Rao-Fadell to enable a policy that applies prioritization (e.g., a lower priority) as suggested by Rao and Fadell. *Supra* §VII.A; EX-1015 ¶342.

5. [1e] “determine at least an aspect of a policy based on a user input obtained through a user interface of the wireless end-user device or based on information from a network element,”

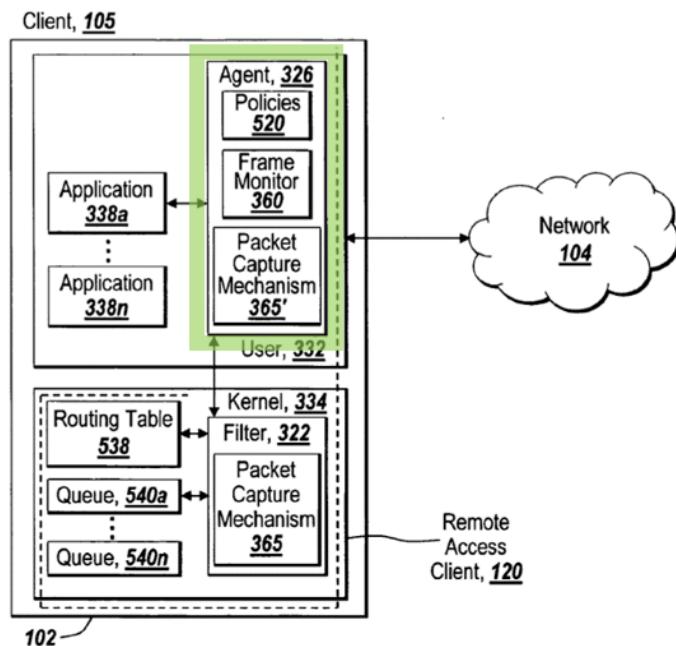
Rao discloses remote access client 120 may include “***one or more policies 520*** [a policy] for specifying client-side prioritization of network communications related to applications 338a-338n.” Rao ¶182. Rao’s prioritization is a policy, and the specific priority assigned to intercepted packets is an aspect of that policy. EX-1015 ¶¶91-92, 95; Rao ¶¶38-43, 180, 182.

Policies 520 may be “provided by or downloaded [to agent 326] ***via the gateway 340***” (a network element) over network 104. Rao ¶183; *id.* ¶¶87, 90-96 (“communicat[ing] over the network 104 to the gateway 340”). Accordingly, the policy would be based on information from a network element. EX-1015 ¶93.



*Fig. 1A*

Rao, Fig. 1A (annotated).



*Fig. 5A*

*Id.*, Fig. 5A (annotated).

Further, a user may “configur[e]” an aspect of a policy through “*a user interface, graphical or otherwise, design[ed] and constructed for configuring or specifying the policies 520.*” *Id.* ¶183; EX-1015 ¶94.

If Rao does not expressly disclose determining at least an aspect of the policy, Rao renders this obvious. Rao emphasizes prioritization on an application-by-application basis, Rao ¶¶182, 191, and a POSITA would therefore have been motivated to obtain information from the network or the user to determine the prioritization to be applied (both generally and to the specific application and associated packets) to implement the system as Rao suggests, EX-1015 ¶96; Rao ¶184.

Rao’s teachings, including those associated with Rao’s remote access client, would be incorporated into Rao-Fadell. EX-1015 ¶343. To the extent it is argued Rao alone does not disclose this limitation, it would have been obvious to combine Rao and Fadell to provide a policy that specifies a prioritization for network packets and notifies a user when a resource usage threshold is reached. *Id.* ¶¶344-50; *supra* §VII.A.

Fadell discloses that a user may receive “reminders or alarms” that the user has reached a resource limit or threshold. Fadell ¶¶51-53, 48-50, 54-70. Fadell thus discloses a “policy” (e.g., providing notifications at a threshold) and an “aspect of a policy” (e.g., threshold value). EX-1015 ¶¶344-50.

Fadell determines the usage threshold and whether it has been reached based on (1) information regarding resource use from “*a router or network component downstream*” (network element) and/or (2) user-defined ranges (user input) provided via “component[s] for allowing a user to provide inputs” (user interface). Fadell ¶¶36-37, 50-51; EX-1015 ¶¶344-50. At least an aspect of the policy is based on the range/threshold (user input) or the resource use information (information from a network element). EX-1015 ¶¶344-50.

The Fadell policy notifies the user when a resource usage threshold is reached, and these notifications are thus based on the limit/threshold information received from the network element or user:

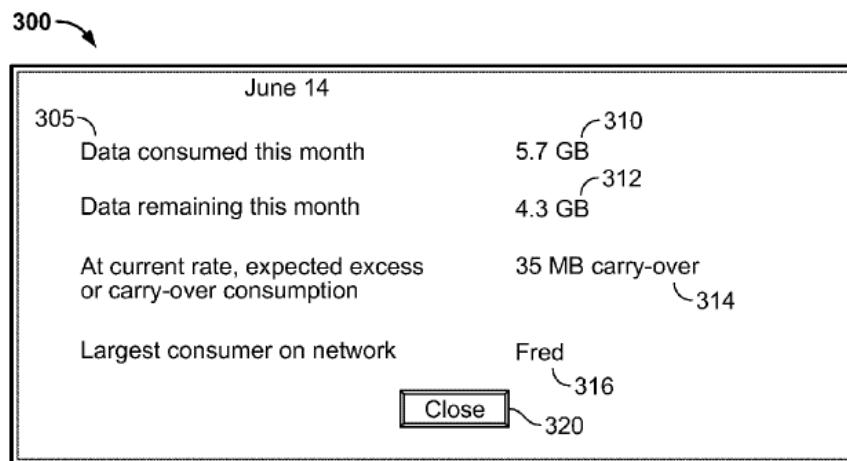


FIG. 3

Fadell, Fig. 3.

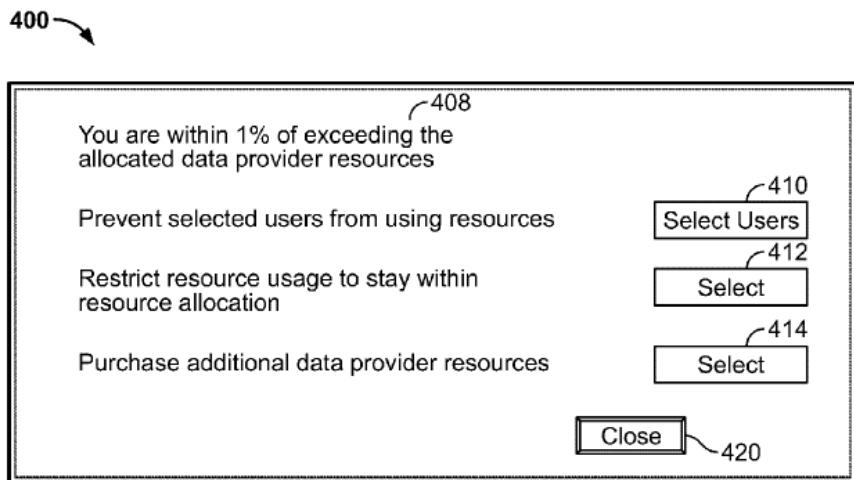


FIG. 4

*Id.*, Fig. 4.

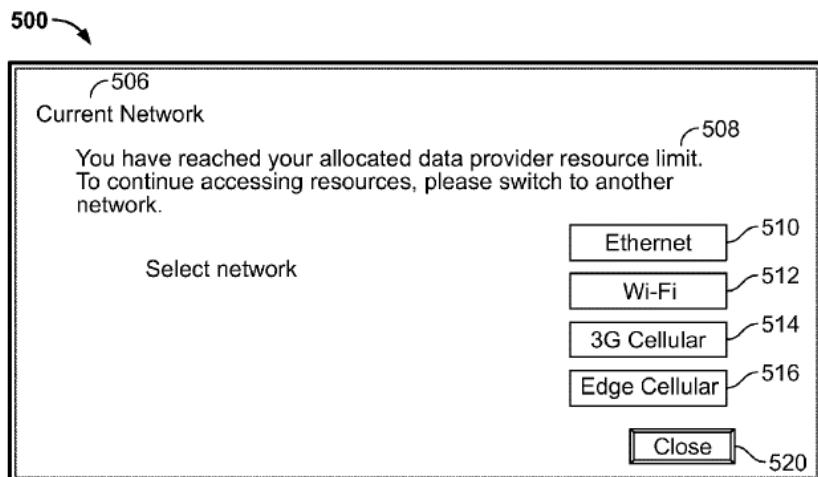


FIG. 5

*Id.*, Fig. 5, ¶¶50-70; EX-1015 ¶¶344-350.

For the reasons discussed, *supra* §VII.A, a POSITA would have combined Rao and Fadell to provide a system with a policy that controls network activity and alerts a user when resource usage limits approach a threshold, implementing these features in Rao-Fadell, which discloses [1e]. A POSITA also would have combined

Rao with Fadell for the reasons explained in Fadell: to “assist the consumer in avoiding excess fees or penalties[] the consumer may receive (e.g., from the data provider or from the resource utilization component).” Fadell ¶51; EX-1015 ¶¶348-49. This would have allowed a user to control resource usage, avoid overage charges, and prioritize foreground activity when resource usage limits are reached. EX-1015 ¶¶348-49.

**6. [1f] “the policy to be applied if the service usage activity is the background activity, the policy at least for controlling the service usage activity; and”**

Rao’s policies 520 may “define [packet] prioritization based on *whether* an application is running in the *foreground or the background*.” Rao ¶¶182, 188-89, 40-42, 193 (“packets may be further prioritized by the *characteristic of the application* . . . , e.g., a *foreground application*”). “The policies 520 may be specified *conditionally*,” so that no policy applies to some packets, and packets associated with different applications may have higher or lower priority. *Id.* ¶¶182, 193; EX-1015 ¶¶97-99.

Rao therefore discloses conditional policies based on whether the application (and, as a POSITA would have understood, its associated network communication/service usage activity) is background activity. EX-1015 ¶100. By defining prioritization based on whether an application is running in the background (e.g., assigning specific priority to the service usage activity associated with the

application), Rao discloses its policy is to be applied if the service usage activity is the background activity. *Id.* The policy “controls” the service usage activity by prioritizing and communicating the packets “according to the determined priority.” Rao ¶¶189-95, 40-41, Fig. 5B (steps 570, 575); EX-1015 ¶¶100-101.

Alternatively, these disclosures at least render obvious applying prioritization (the policy) to queued packets “if” they are associated with background applications such as background service usage activity (e.g., for remote access client 120 to focus on deprioritizing background applications associated with background service usage activity). Rao ¶¶182, 188-89, 193, 40-42; EX-1015 ¶¶102-103. This would have improved Rao and furthered its objectives of, e.g., reducing network congestion, improving bandwidth available to foreground applications, and improving system speed/efficiency, by assigning background activity, including unnecessary/unwanted/unknown activity, a lower priority than actively used applications. Rao ¶¶3, 80, 184; EX-1015 ¶¶104-05.

In the combined Rao-Fadell system, it would have been obvious to implement Rao’s policy of assigning a priority to network packets based on the packets being background activity when a resource usage limit or threshold is reached and a user is notified, as taught by Fadell. Fadell ¶¶49-72, Figs. 3-6; EX-1015 ¶¶354-55. As discussed, *supra* §VII.A, in Rao-Fadell, a POSITA would have been motivated to apply a lower prioritization to background activity and notify a user when a resource

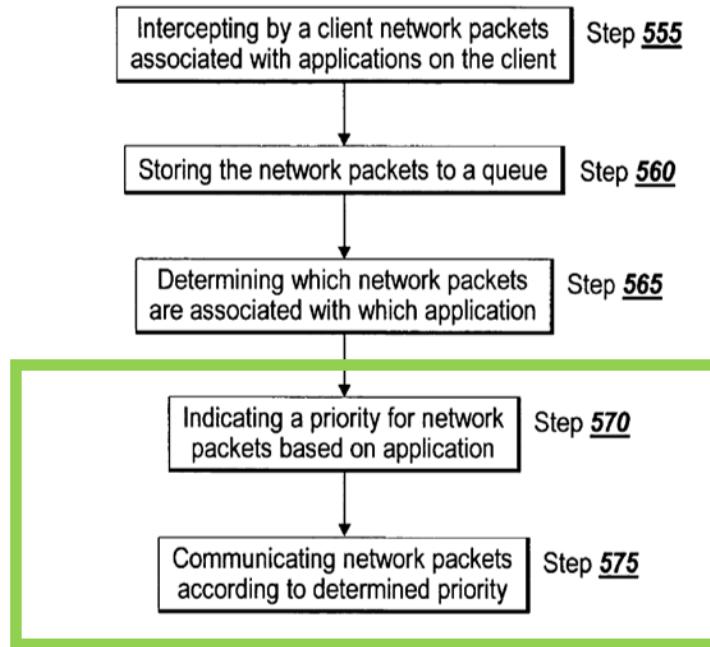
usage limit or threshold is reached to prevent inadvertent overages, reduce consumer costs, and provide Fadell's notifications that include options for proceeding. EX-1015 ¶¶354-55.

7. **[1g] “if it is determined that the service usage activity is the background activity, apply the policy.”**

Rao assigns priority to network packets associated with background activity (service usage activity determined to be background activity) and transmits those packets according to that priority, thus applying the policy. EX-1015 ¶¶106-109.

“[A]gent 326 uses the policies 520 to *apply a priority* to network packets of applications 338a-338n in accordance with the prioritization rules specified or indicated by the policies 520,” including those based on “characteristics . . . such as running in the foreground or *background*, to indicate priority for a network packet of the application.” Rao ¶189, Fig. 5 (Step 570). Agent 326 then “indicates the priority to the filter 322 . . . *to apply* the indicated priorities.” *Id.* ¶¶189-93; EX-1015 ¶108. The packets are communicated “according to the determined priorities.” Rao ¶¶194-95, Fig. 5 (Step 575); EX-1015 ¶108.

550



*Fig. 5B*

Rao, Fig. 5B (annotated).

At minimum, Rao renders obvious applying a policy *if* it is determined the service usage activity is the background activity for the reasons discussed. *Supra* [1f]; EX-1015 ¶110. For example, applying prioritization (e.g., lower priority) to queued packets received from background applications would further Rao's objectives, and a POSITA would have been motivated to do so. *Supra* [1f]; Rao ¶¶3, 80, 184; EX-1015 ¶110.

In Rao-Fadell, it would have been obvious to apply Rao's prioritization to network packets determined to be background activity at least when a threshold is reached. EX-1015 ¶¶356-63.

In doing so, it would have been obvious to apply prioritization (e.g., lower priority) to background activity packets and notify a user of data resources (e.g., via Fadell's screens 300-500) to enable the user to control how to proceed. Fadell ¶¶50-71, Figs. 3-6; EX-1015 ¶¶360-63. For example, a user may elect, as Fadell teaches, to "reschedule or cancel processes requesting data of lesser importance" via screen 400 and cause intercepted and/or future intercepted background activity packets to remain in a queue, as taught by Rao. Fadell ¶¶57-60; Rao ¶¶180-95; EX-1015 ¶¶360-63. A POSITA would have applied and/or modified Rao in this manner to prevent inadvertent overages and reduce costs for the consumer, and been motivated to do so for the reasons discussed above. *Supra* [1f], §VII.A; EX-1015 ¶¶360-63.

### C. Claim 91

1. **"... claim 1, wherein apply the policy comprises cause a notification to be presented through a user interface of the wireless end-user device."**

Fadell's consumer "receive[s] any suitable type of report, notice, reminder or alarm related to data provider resource consumption." Fadell ¶49; EX-1015 ¶504. Fadell's screen 300 provides "data resource usage information," screen 400 provides "selectable options for several actions that the consumer may take ... within [a] predetermined range of the allocated resource limit," and screen 500 "prompt[s] a user to switch networks." Fadell ¶¶49, 54, 51; EX-1015 ¶504.

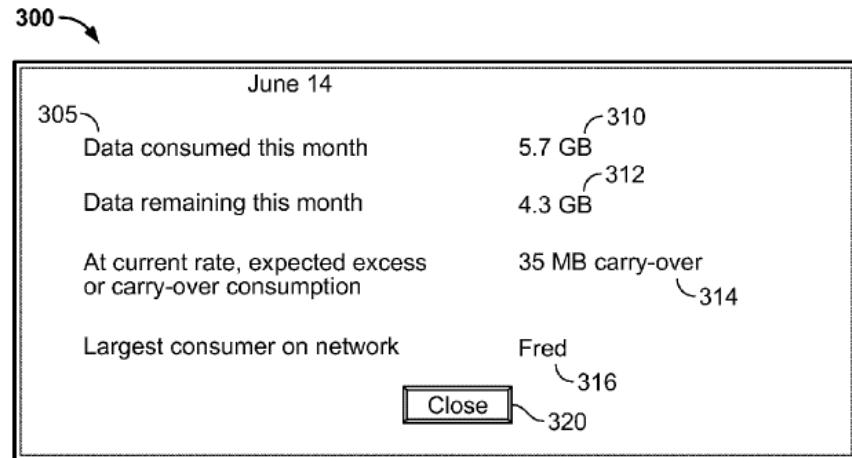


FIG. 3

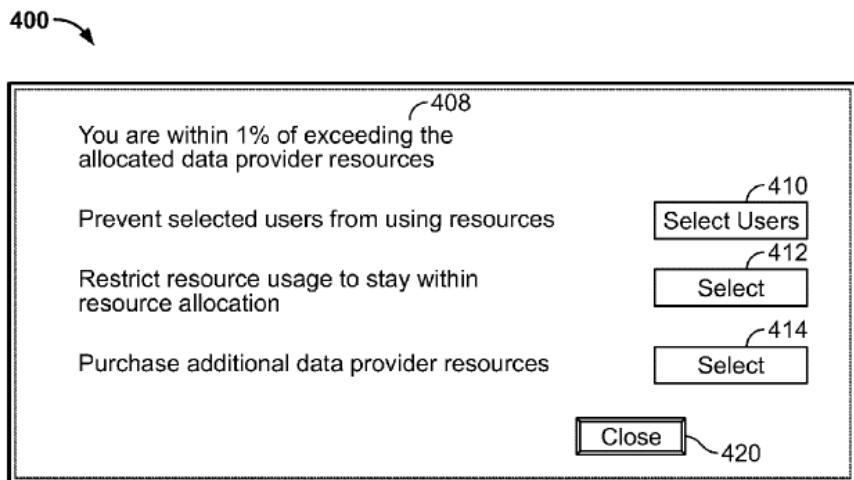


FIG. 4

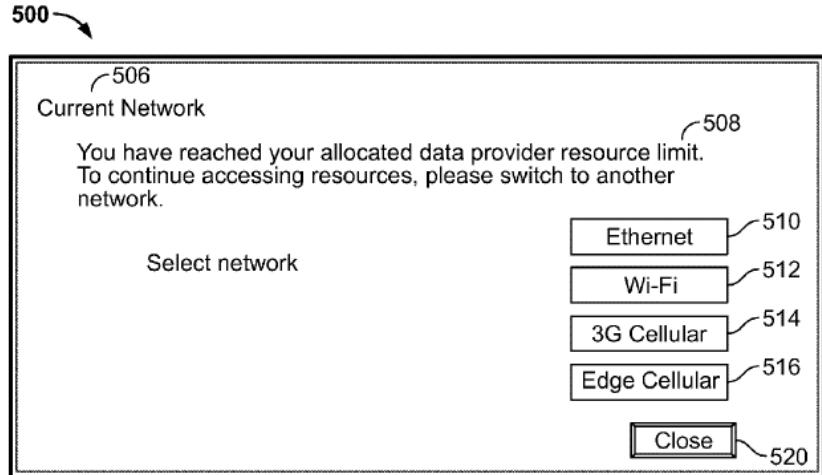


FIG. 5

Fadell, Figs. 3-5.

A POSITA would have combined Fadell's resource usage notifications with Rao's queuing and prioritizing background-activity-network packets to provide a policy that controls network activity and causes a notification to be presented when resource usage limits approach a threshold. *Supra* claim 1; EX-1015 ¶505.

A POSITA would have been motivated to present notifications based on Fadell's teaching and suggestion. EX-1015 ¶506; Fadell ¶49, Figs. 3-5. This would have provided user-selectable options (e.g., time-scheduling or selecting a new network), as Fadell suggests, Fadell ¶49, Figs. 3-5, and would have required merely routine skill given Rao's and Fadell's user interface disclosures, *supra* [1e], and the ubiquity at the time of such notifications, EX-1015 ¶506.

#### D. Claim 92

##### 1. “... claim 91, wherein the notification provides information about the policy.”

Fadell’s notifications (*supra* claim 91) include “the amount . . . of resources consumed for a tier subscription period,” the expected consumption for a period, and/or expected data overage penalties. Fadell ¶¶49-53, Fig. 3; EX-1015 ¶¶507-08. They provide the “expected excess consumption or carry-over for the period (e.g., month),” “indicat[e] that the consumer has reached a limit in data provider resources,” and notify the consumer within a predetermined range of the limit. Fadell ¶¶53-62, Figs. 3-5; EX-1015 ¶¶508-09.

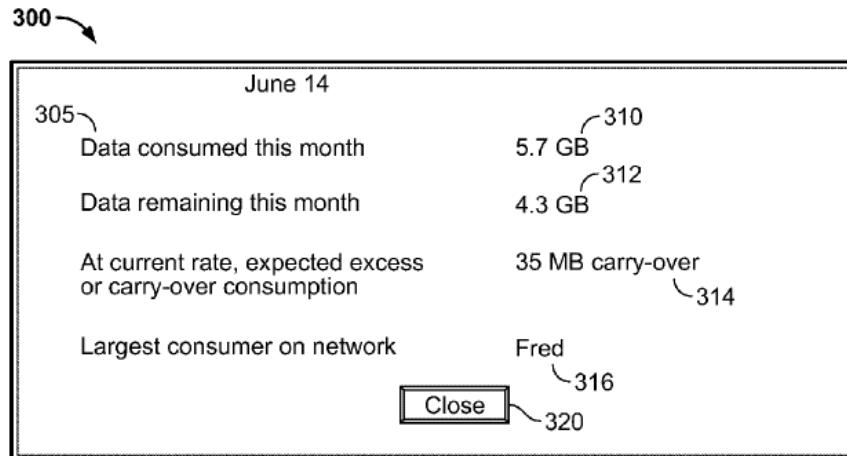


FIG. 3

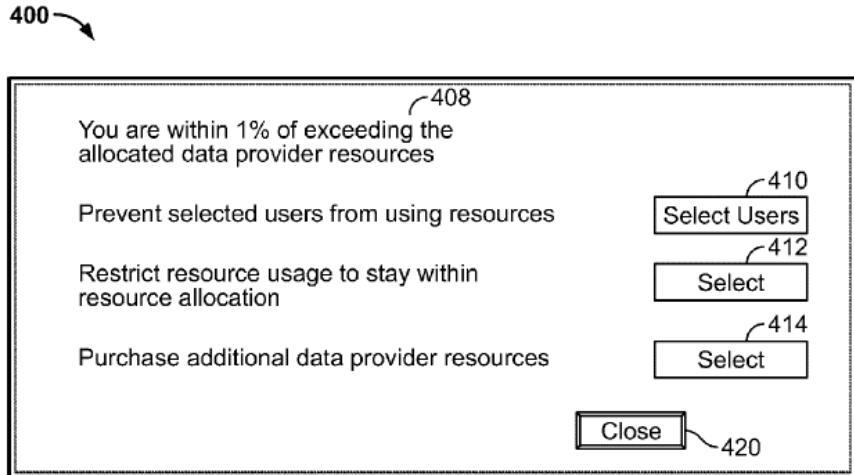


FIG. 4

Fadell, Figs. 3-5.

These notifications would have provided information about Rao-Fadell's policy. *Supra* [1a]-[1g]; EX-1015 ¶510. The Rao-Fadell policy intercepts background network packets, defines prioritization for the packets, and notifies the user when a resource usage threshold is reached. *Supra* [1a]-[1g]. Fadell's notifications provide information about, e.g., the resource usage threshold set by the user within the policy. EX-1015 ¶510.

A POSITA would have been motivated to present Fadell's notifications with information about the policy to allow the user to understand the policy being implemented, select how to proceed, and better understand and control resource usage to prevent data overages/charges. *Id.* ¶511; Fadell ¶¶49, 51-52, Figs. 3-5. This would have required only routine skill for a POSITA given Rao's and Fadell's user

interface disclosures, *supra* [1e], Fadell's disclosure of notifications, and the well-known nature of these concepts, EX-1015 ¶511.

#### E. Claim 93

1. “... claim 91, wherein the notification provides information about an option to set, control, override, or modify the at least an aspect of the policy . . . .”

Fadell's screen 400 has selectable options 410, 412, and 414 for user responses to Fadell's notifications. *Supra* claim 91; Fadell ¶¶53-62, Fig. 4.

Option 410 prevents or allows data resource access. Fadell ¶¶ 53, 55. Option 412 (i) restricts transmission of certain data types; or (ii) changes the data transfer process to reduce resource use. *Id.* ¶56. Option 414 purchases resources. *Id.* ¶53.

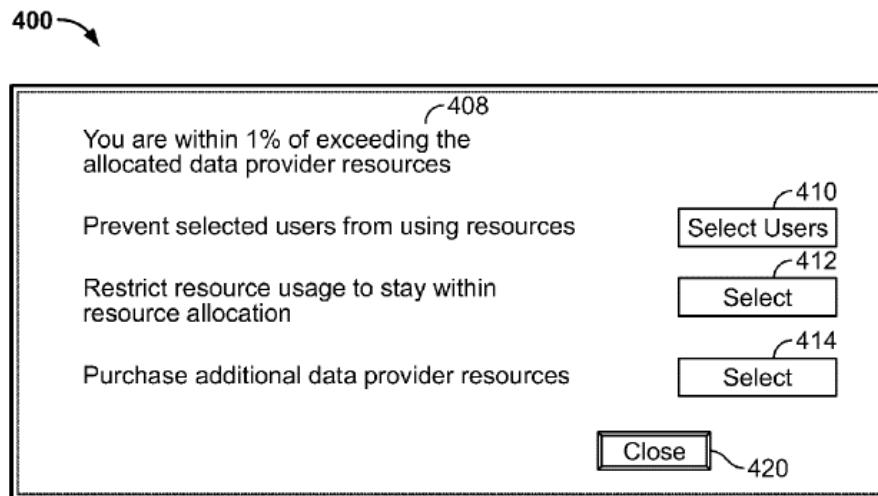


FIG. 4

*Id.*, Fig. 4.

Fadell's options disclose or would have rendered obvious a notification that provides an option to set, control, override, or modify at least an aspect of the Rao-

Fadell policy. EX-1015 ¶¶512-15. Preventing data use (options 410, 412) teaches setting, controlling, and/or modifying an aspect of a policy by setting/controlling/modifying how Rao-Fadell handles queued packets. *Id.*

A POSITA would have implemented Rao-Fadell to prevent packets from being communicated if the user selects option 410 or 412. *Id.* ¶516. Such controls would set, control, and/or modify at least an aspect of the policy controlling how packets are communicated from the queues. *Id.*; *supra* [1a]-[1g]. A POSITA would have been motivated to implement Rao-Fadell this way because it would have provided users greater control of data usage, prevented data overages, and given users options for how to use data in Rao-Fadell. EX-1015 ¶516.

Fadell's option 414 to purchase additional data, Fadell ¶57, also discloses setting, controlling, overriding, and/or modifying at least an aspect of the policy, EX-1015 ¶517. Purchasing additional data with option 414 would have set, controlled, overridden, or modified the data threshold set by the user, an aspect of the policy. *Id.* A POSITA would have been motivated to implement Rao-Fadell in this way because it would have provided users greater control of data usage, prevented data overage charges, and given users options for avoiding data overages.

*Id.*

Fadell also discloses an option to exceed the allocated resources. Fadell ¶53. A POSITA would understand this to be an override of at least an aspect of the policy

and would have implemented Rao-Fadell this way for similar reasons. EX-1015 ¶518.

A POSITA would have been motivated to present Fadell's notifications with information about options to set, control, override, or modify an aspect of the policy in Rao-Fadell in view of Fadell's examples and suggestion to do so. *Id.* ¶519; Fadell ¶¶49, 50-72, Figs. 3-6. Providing these options would have allowed the user to determine how the policy is implemented, select how to proceed, and better understand and control resource usage to prevent data overages and associated charges. EX-1015 ¶519; Fadell ¶¶49, 51-52. This would have required only routine skill. EX-1015 ¶519.

#### F. Claim 94

##### 1. “...claim 91, wherein, ... the one or more processors . . . obtain an indication of a user response to the notification.”

Fadell discloses options 320, 410-414, 420, and/or 510-516 and 520. Fadell ¶¶49, 50-70, Figs. 3-5; *supra* claim 91. Options 320, 420, and 520 close their respective screens. Fadell ¶50, 57, 65, Figs. 3-5. Options 410-412 and 510-516 provide responses to their respective screens. *Id.* ¶¶54-63, Figs. 4-5; *supra* claim 93.

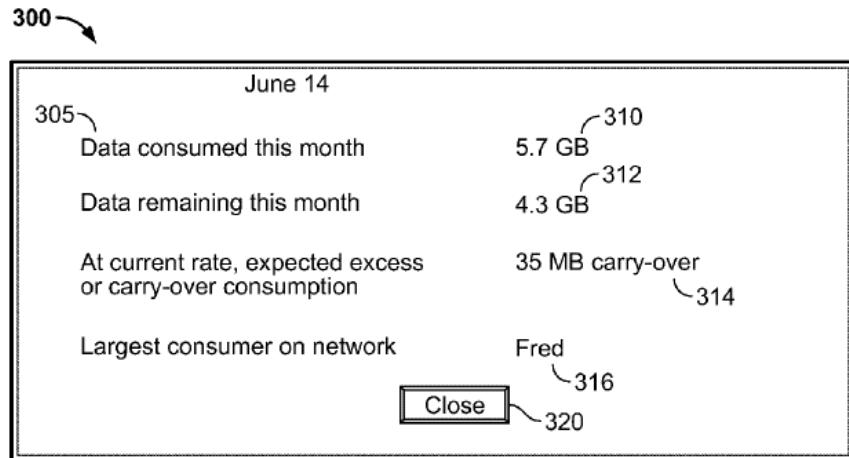


FIG. 3

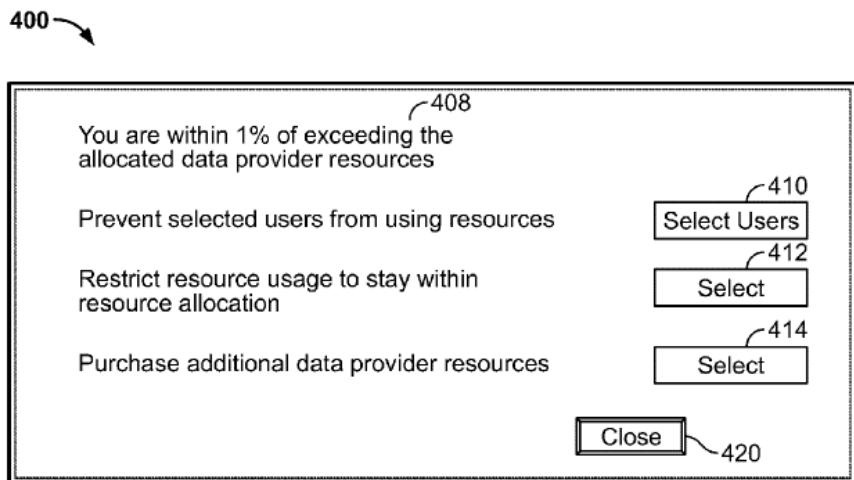


FIG. 4

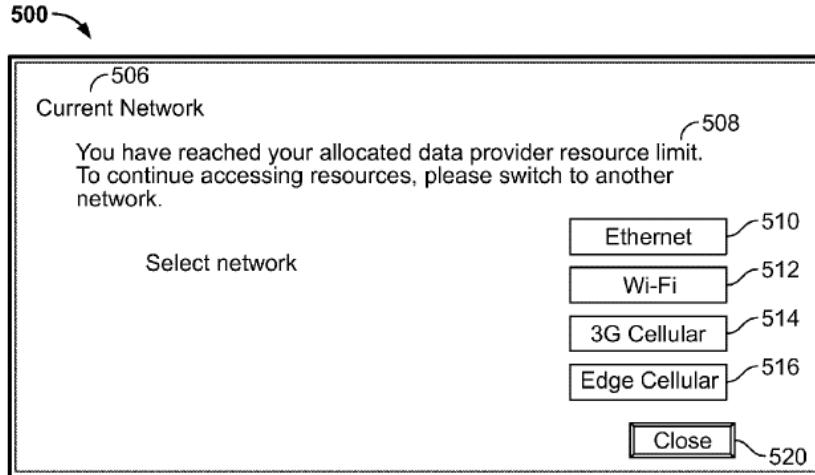


FIG. 5

Fadell, Figs. 3-5.

Each option obtains an indication of a user response to the notification. EX-1015 ¶¶520-24. Each option is selectable and indicates the user's response to the notification including, e.g., closing the screen, switching networks, and/or restricting resource usage or users. *Id.*

A POSITA would have been motivated to cause Fadell's notification to obtain an indication of a user response based on Fadell's examples and suggestion. *Id.* ¶525; Fadell ¶¶49, 50-70, Figs. 3-5. This would have allowed Rao-Fadell to register that a user received the notification and would have allowed the user to select how to proceed, determine how to implement the policy, and understand and control resource usage. EX-1015 ¶525; Fadell ¶¶49, 51-52. Implementing this would have required only routine skill. EX-1015 ¶525.

## G. Claim 95

1. “... claim 91, wherein the notification provides a warning or an alert.”

Fadell’s screens 300-500 provide a “warning” and “alert.” Fadell ¶¶22, 51-53 (referring to notifications as “warnings” or “alert[s]”); EX-1015 ¶¶526-28; *supra* claims 1, 91.

## H. Claim 96

1. “... claim 91, wherein the notification provides information about a service plan limit.”

Fadell’s notifications provide “a notice of the amount... of resources consumed for a tier *subscription period*.” Fadell ¶49. The notifications assist in avoiding “excess fees or penalties, the consumer may receive (e.g., from the *data provider*).” *Id.* ¶51. This includes determining “that the consumer has reached an *initial limit or threshold* that is less than the *allocated resource limit*” and providing screen 300. *Id.* Screen 400 indicates “the consumer has reached a *limit in data provider resources*,” *id.* ¶54, and screen 500 indicates “the allocated *data provider resource limit* for the current network,” *id.* ¶63.

These alerts disclose “information about a service plan limit.” *Id.* ¶¶43-44. A POSITA would have been motivated to display Fadell’s notifications with this information to enable a user to understand his or her data usage, prevent inadvertent overages and unwanted fees, and decide how to proceed when a limit/threshold is met. EX-1015 ¶¶529-33; *supra* claims 1, 91.

## I. Claim 99

1. “...claim 91, wherein the policy is based on a limit, and ... determine that a data usage associated with the service usage activity is not less than the limit, and ... trigger presentation of the notification based on the determination ...”

Fadell discloses a policy based on a limit by disclosing notifications indicating the consumer's resource use and whether it is approaching, has reached, or has exceeded a “limit or threshold.” *Supra* claim 92; Fadell ¶¶51, 54-56, 71-72, Figs. 3-6; Fadell ¶¶49-50, 52-53, 57-70; EX-1015 ¶¶535-36. Fadell provides screen 300 and/or 400 in response to determining that data usage exceeds (“is not less than”) a provider resource limit. Fadell ¶¶49-52, 54-56, 63. Fadell also provides screen 500 in response to determining that data provider resource limit “has been reached.” *Id.* ¶¶ 63-70, Fig. 5.

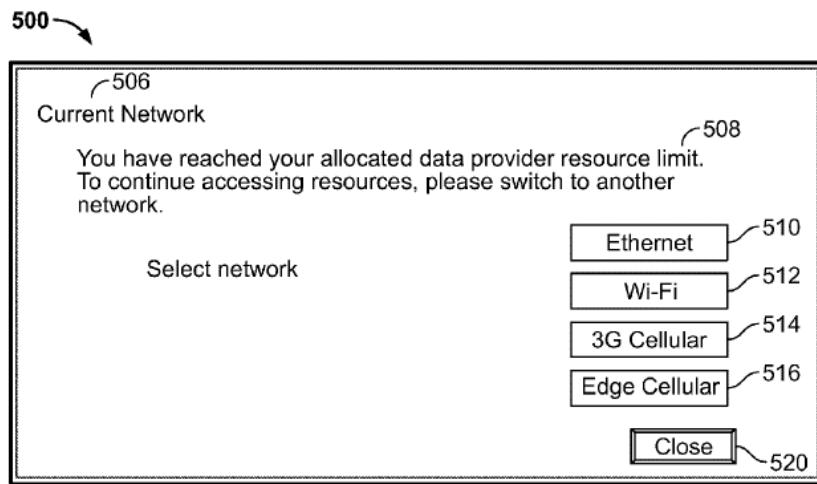


FIG. 5

*Id.*, Fig. 5.

A POSITA would have incorporated Fadell's limit, including the initial limit or threshold set by a user and/or a data provider resource limit, into the Rao-Fadell policy to trigger Fadell's notifications when data usage has reached the threshold, limit, or range. EX-1015 ¶¶534-40; *supra* claim 91. A POSITA would have been motivated to do so, as Fadell teaches, to enable a user to understand resource usage, prevent inadvertent overages, and decide how to proceed when a limit or threshold is met. EX-1015 ¶¶539-40; Fadell ¶¶49, 50-70, Figs. 3-5; *supra* claim 92 (providing motivations applicable here).

#### J. Claim 102

1. **“...claim 91, wherein the notification indicates that one or more service usage activities are subject to the policy.”**

Fadell discloses notifications indicating that resource usage has reached or exceeded a limit. *Supra* claim 91; EX-1015 ¶542; Fadell ¶¶49, 50-70, Figs. 3-5. Fadell's data usage notifications indicate a service usage activity is subject to the policy. EX-1015 ¶¶541-42. That is, Fadell's notifications indicate that a resource usage limit/threshold has been reached, and therefore “one or more service usage activities” (e.g., data transfers/network packets) are subject to the policy. *Id.* Fadell's option 412 to restrict resource usage based on the types of data transmitted, protocol, or user requesting the transfer, indicates one or more service usage activities (e.g., related to the restricted usage) are subject to the policy. Fadell ¶56, Fig. 4. It also would have been obvious for the Rao-Fadell notifications to tell the user that certain

background communications are being deprioritized because of the resource usage limit, as Rao teaches. EX-1015 ¶542; *see* Rao ¶¶179-95.

A POSITA would have incorporated Fadell's usage notifications into Rao. *Supra* claims 93, 91; EX-1015 ¶543. Providing notifications that indicate a service usage activity is subject to a policy would have enabled a user to understand his/her data usage, prevent inadvertent overages, and decide how to proceed when a limit or threshold is met. EX-1015 ¶543. A POSITA would have been motivated to cause such usage-based notifications to allow a user to select how to proceed, determine how the policy is being implemented, and understand and control resource usage to prevent data overages and associated charges. *Id.*; Fadell ¶¶49-70, Figs. 3-5. Providing such notifications would have required only routine skill. EX-1015 ¶543.

## K. Claim 103

### 1. “...claim 91, wherein the notification provides information about a second network.”

Screen 500 includes options to switch to Ethernet, Wi-Fi, 3G cellular, or EDGE cellular networks. Fadell ¶¶63-70, Fig. 5; *supra* claims 1, 91. These options identify networks by unique identifiers, such as by name and type, Fadell ¶63, which are both “information about a second network,” EX-1015 ¶¶544-45.

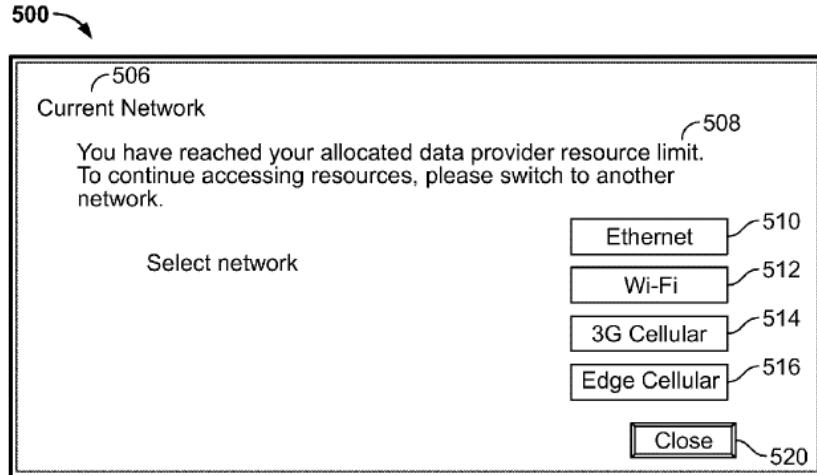


FIG. 5

Fadell, Fig. 5.

A POSITA would have incorporated Fadell's screen 500 into Rao-Fadell to prevent inadvertent overages and unwanted fees, and to allow a user to decide how to proceed when a limit/threshold is met. EX-1015 ¶546; *supra* claims 1, 91. This includes switching networks when reaching a data limit on a first network. EX-1015 ¶546. Providing such notifications would have required only routine skill. *Id.* ¶547.

#### L. Claim 104

1. “... claim 91, wherein the notification comprises an offer for a service plan upgrade or downgrade.”

Screen 400 includes “option 414 for purchasing additional data provider resources.” *Supra* claims 1, 91; Fadell ¶57, Fig. 4.

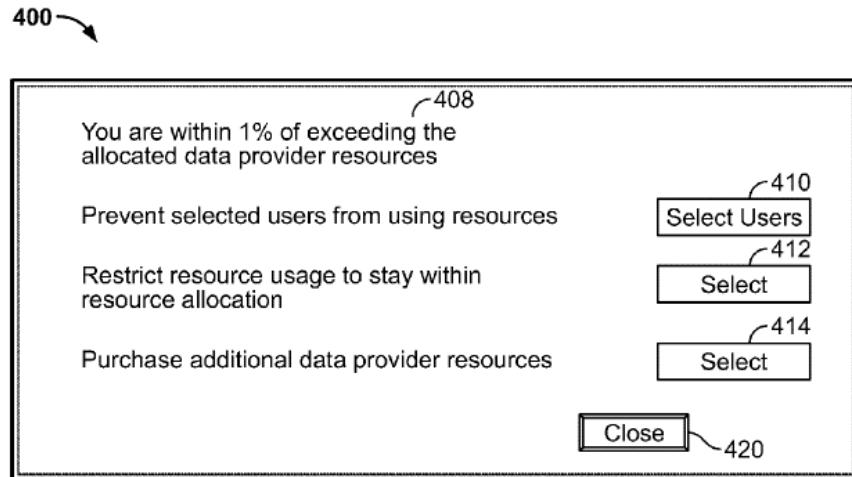


FIG. 4

*Id.*, Fig. 4.

Option 414 offers a service plan upgrade. EX-1015 ¶¶548-50. In response to its selection, a data provider provides additional resources that otherwise would exceed a given plan. Fadell ¶¶57, 43, 44; EX-1015 ¶550.

A POSITA would have combined Fadell's upgrade option into Rao-Fadell to give additional user control over the policy by purchasing more resources, thereby preventing overages. EX-1015 ¶551; Fadell ¶¶54-62, Fig. 4. A POSITA would have expected success based on Fadell's teachings. EX-1015 ¶551.

## M. Claim 105

1. “... claim 91, wherein apply the policy further comprises obtain an indication of a user preference in response to the notification.”

Fadell discloses options 320, 410, 412, 414, 420, 510, 512, 514, 516, and 520.

Fadell ¶¶49, 50-70, Figs. 3-5; *supra* claim 94.

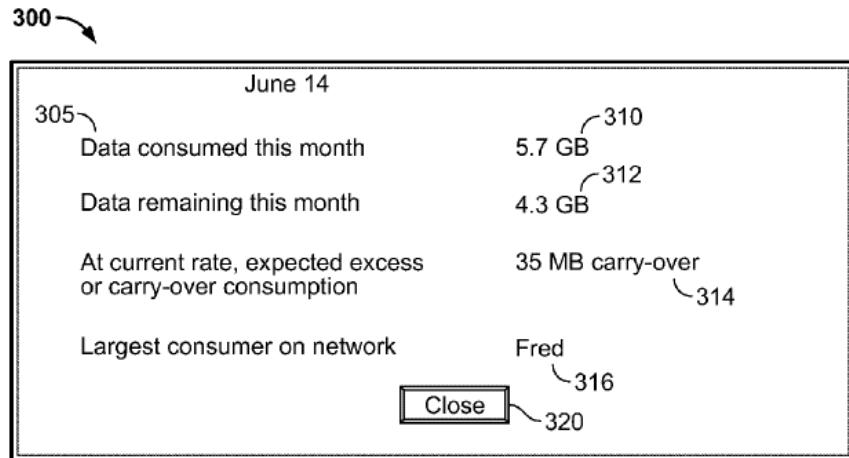


FIG. 3

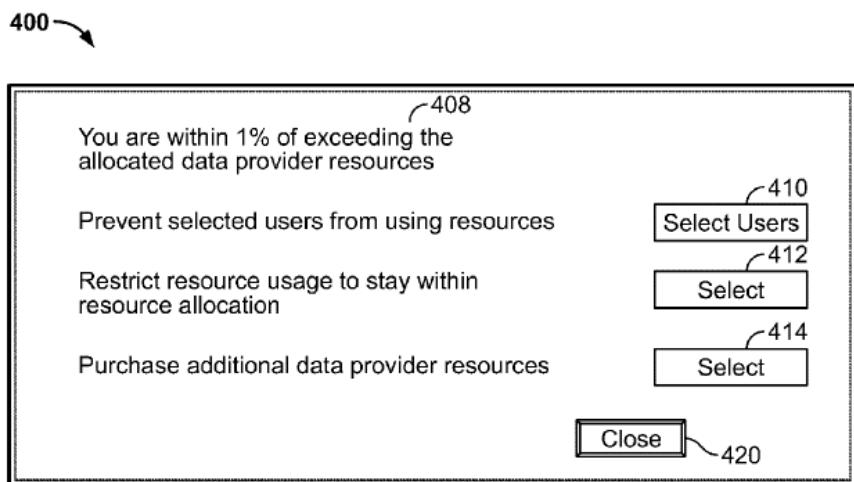


FIG. 4

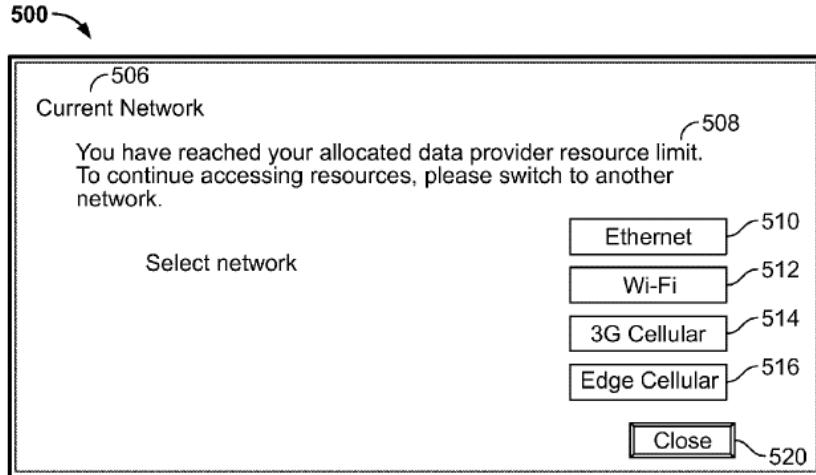


FIG. 5

Fadell, Figs. 3-5.

Each option indicates “user preference” in response to Fadell’s notification. EX-1015 ¶¶552-55. Closing the notification via options 320, 420, and 520 indicates a preference to close the notification. *Id.* Options for restricting use or switching networks indicate preferences to restrict resource usage and switch networks. *Id.* A POSITA would have implemented Fadell’s screens 300-500, including their options to capture a user preference, into Rao-Fadell. *Id.* A POSITA would have been motivated to do so to capture how the user would like to proceed at or near a data limit, control implementation of the policy in Rao-Fadell, and enable the user to prevent data overages and associated charges. *Id.* ¶556; Fadell ¶¶49-70, Figs. 3-5. Doing so would have required only routine skill. EX-1015 ¶556.

## N. Claim 106

1. **“... claim 105, wherein the indication of the user preference comprises a user directive to associate the policy with a second software component.”**

Fadell’s option 412 restricts “data transfers . . . based on the protocol or **application** requesting the data transfer.” Fadell ¶¶56, 59, Fig. 4. Fadell’s disclosure of selecting option 412 discloses or renders obvious claim 106. EX-1015 ¶¶557-58.

A POSITA would have included option 412 in Rao-Fadell to allow a user to direct application of Rao-Fadell’s policy to packets associated with a selected application, in the same or similar manner as the policy applies to background activity. EX-1015 ¶559. A POSITA would have been motivated to do so and would have expected success based on Fadell’s teachings. *Id.* ¶560; Fadell ¶¶49, 57-62, Fig. 4. This would have enabled a user to control implementation of the policy in Rao-Fadell and target particular applications, enabling the user to prevent data overages and associated charges. EX-1015 ¶560; Fadell ¶¶49, 51-52. For example, a user may understand that a particular application, including a second software component that is a separate component or application from background activity of a first software component (*supra* claim 1), may consume considerable resources and wish to restrict usage of that application when at a resource usage limit/threshold. Fadell ¶53; EX-1015 ¶560.

## O. Claim 107

1. “**... claim 105, wherein the indication of the user preference comprises a user directive to allow or block the service usage activity.”**

Fadell’s option 412 “restrict[s] resource usage to stay within the resource allocation.” Fadell ¶¶56, 59, Fig. 4. Fadell also discloses enabling the user to “**prevent** the download of media data, but **allow or permit** the download of web pages or other non-media intensive transfers.” *Id.* ¶59. Users may “reschedule or cancel processes requesting data of **lesser importance.**” *Id.* ¶60. Users may also allow the data transfer by purchasing additional data resources from the provider. *Id.* ¶53.

Opting to “restrict,” “prevent” or “cancel” is a user preference that includes a user directive to block the service usage activity (at least temporarily), and opting to “allow” or purchase additional data resources allows a service usage activity. EX-1015 ¶¶561-63. The preference includes, for example, identifying the particular data transfer, and the directive is, for example, restricting, preventing, or canceling it. *Id.*

A POSITA would have applied these teachings in Rao-Fadell to enable a user to restrict or allow the intercepted network packets (e.g., of “lesser importance,” which corresponds with Rao’s background activity). *Id.* ¶564; Fadell ¶¶49, 57-62, Fig. 4. This would have enabled a user to control implementation of the Rao-Fadell

policy and elect whether to allow or permit queued background activity to control resource usage and prevent overages. EX-1015 ¶¶565; Fadell ¶¶49, 51-52. Doing so would have required only routine skill. EX-1015 ¶¶565.

#### P. Claim 108

1. **“... claim 105, wherein the indication of the user preference identifies a traffic control setting associated with the policy.”**

The '541 patent discloses “traffic control techniques,” e.g., “throttle, delay, priority queue, time window, suspend, quarantine, kill, [or] remove” service usage activity. EX-1001, 19:47-53.

Fadell’s restricting or allowing resource usage via screen 400 discloses claim 108 because Fadell discloses throttling, delaying, suspending, and killing resource usage by “prevent[ing],” “reschedul[ing],” or “cancel[ing]” the activity. Fadell ¶¶56, 59-61, Fig. 4; *supra* claim 107.

Fadell similarly discloses time-windowing resource usage. Fadell ¶61 (describing rescheduling and metering “based on the day or time of day”). Rao also discloses a traffic control setting via a priority queue by intercepting, queuing, and assigning a priority to network packets. Rao ¶¶179-95, Fig. 5A.

A POSITA would have applied Fadell’s and/or Rao’s teachings in Rao-Fadell to enable a user to restrict, delay, queue, and/or permit resource usage when a data limit or threshold is reached. EX-1015 ¶¶566-69. For example, screen 400 would

enable a user to restrict/allow intercepted/queued packets and reschedule or cancel processes of “lesser importance.” *Id.* A POSITA would have been motivated to do so and expected success based on Rao and Fadell’s teachings. *Id.* ¶570; Fadell ¶¶49, 57-62; Rao ¶¶179-95. This would have enabled a user to control implementation of the policy in Rao-Fadell and elect whether to allow or permit queued background activity to prevent overages and associated charges. EX-1015 ¶570; Fadell ¶¶49, 51-52.

**Q. Claim 109**

1. **“... claim 105, wherein the indication of the user preference comprises a user directive to allow the service usage activity under a specified condition.”**

Fadell’s allowing “download of web pages or other non-media intensive transfers” via screen 400 and rescheduling processes of “lesser importance” discloses claim 109. Fadell ¶¶56, 59-60. By allowing certain applications like web pages and “non-media intensive transfers” to proceed, or by rescheduling lesser important tasks, a user is allowing the service usage activity under a specified condition. EX-1015 ¶¶571-73. The condition includes the specific application or identified network packets associated with a web browser or other applications requesting “non-media intensive transfers.” *Id.*; Fadell ¶¶56, 59-60. Fadell’s rescheduling also teaches claim 109, because it applies a time-based condition to allow the rescheduled activity. EX-1015 ¶573; Fadell ¶¶56, 59-60.

A POSITA would have applied these teachings to Rao-Fadell to obtain an indication of user preference to permit queued network packets associated with background activity in view of Fadell's teaching and suggestion. EX-1015 ¶¶574-75; Fadell ¶¶49, 57-62, Fig. 4. This would enable a user to control implementation of the policy in Rao-Fadell and elect whether to allow or permit queued background activity and thus control resource usage and prevent overages and associated charges. EX-1015 ¶575; Fadell ¶¶49, 51-52. The modification would require only routine skill. *Supra* claim 108; EX-1015 ¶575.

#### R. Claim 110

1. **“...claim 105, wherein the indication of the user preference comprises a user directive to override or modify the policy.”**

*Supra* claim 93 (providing options to override/modify policy by indicated preference restricting data use, purchasing data, exceeding data allocation), claim 94, claim 105; EX-1015 ¶¶576-81.

#### S. Claim 111

1. **“...claim 91,... cause the notification to be presented based on occurrence of a trigger.”**

Fadell's “determining that the consumer is within a *particular range* ... [or] has reached an *initial limit or threshold*” discloses an “occurrence of a trigger.” Fadell ¶¶51, 49-72, Figs. 3-6; EX-1015 ¶¶582-84; *supra* claim 99. Fadell discloses presenting a notification in response to determining the resource usage exceeds a limit, threshold, or is within a range of a data provider resource limit for a given

period. Fadell ¶¶49-52, 54-56, 63; EX-1015 ¶585. Fadell also discloses providing notification screen 500 when the data provider resource limit “has been reached.” Fadell ¶¶63-70, Fig. 5; EX-1015 ¶585.

A POSITA would have incorporated Fadell’s trigger, including its initial limit or threshold set by a user and/or a data provider resource limit, into Rao-Fadell’s policy to trigger Fadell’s notifications when resource usage has reached the threshold, limit, or range. EX-1015 ¶586; *supra* claims 1, 91, 99. A POSITA would have been motivated to exercise routine skill and do so to enable a user to understand his/her data usage, prevent inadvertent overages and unwanted fees, and decide how to proceed when a limit or threshold is met. EX-1015 ¶¶586-87; Fadell ¶¶49, 51-52.

#### T. Claim 112

1. **“... claim 111, wherein the trigger is: a measure of the service usage activity satisfies a first condition relative to a threshold . . .”**

*Supra* claims 99, 111 (determining a data usage associated with service usage activity meets/exceeds limit triggers the notification); Fadell ¶¶51-61, 71-72; EX-1015 ¶¶588-89.

Fadell’s initial limit discloses a measure of the service usage activity (e.g., data use associated with background activity) satisfying a first condition relative to a threshold (e.g., using data up to predetermined range). EX-1015 ¶590. For example, where the service usage activity is background activity and the service

usage activity meets or exceeds Fadell's initial limit the service usage activity would satisfy a first condition relative to a threshold. *Id.* ¶591.

A POSITA would have implemented Rao-Fadell to measure resource usage and trigger a notification based on network packets, including those associated with background activity, meeting Fadell's initial usage limit. *Id.* ¶592. A POSITA would have incorporated these conditions in Rao-Fadell to trigger Fadell's notifications and would have expected success. *Supra* claims 1, 91; EX-1015 ¶592. A POSITA would have been motivated to do so to allow a user to select how to proceed and to understand and control resource usage to prevent data overages. EX-1015 ¶593; Fadell ¶¶49, 51-52.

#### **U. Claim 113**

- 1. “... claim 91, wherein the notification enables a user... to obtain information about at least an aspect of... a service plan associated with the wireless end-user device.”**

Fadell's notifications disclose providing information about at least an aspect of a service plan associated with the wireless end-user device (e.g., the service plan limit). *Supra* claims 1, 91, 96; Fadell ¶¶49-72, 43, Figs. 3-6. Fadell's service plan is “associated” with the wireless end-user device because resources are allocated to specific wireless-end user devices/groups. Fadell ¶¶42, 43, 67; EX-1015 ¶594.

## V. Claim 114

1. “... claim 91, wherein the notification presents a list of ... software components ... including ... the first software component.”

Rao-Fadell renders obvious a notification that presents a list of software components including the first software component. EX-1015 ¶¶595-96. Fadell’s screen 400 includes option 412 that “restrict[s] resource usage... based on the protocol or *application requesting the data transfer.*” Fadell ¶56. In response to the selection of option 412, “data transfers may be restricted based on the... *application requesting the data transfer.*” *Id.* A user may “allow or permit” data requests “*based on the application* requesting the data.” *Id.* ¶59.

To restrict data transfers for specific applications, the user would be provided the option to select which applications to restrict or permit continued data transfer. EX-1015 ¶597. It would have therefore been obvious to provide a list of applications (e.g., “software components”) for the user to select and control after selecting option 412. *Id.*

A POSITA would have been motivated to include a list of applications in Rao-Fadell’s notifications, including the first software component to let the user: (i) control implementation of the policy, control which applications can or cannot continue to use data, and thus avoid inadvertent overages and fees; (ii) select which applications could engage in data transfers despite the user being at or near a data

limit; and (iii) prioritize certain applications or maintain their operation while restricting others. *Id.* ¶598. Providing such a list would have required only routine skill for a POSITA, with expected results, and would have been obvious based on Fadell. *Id.*

#### W. Claim 115

1. “... claim 91, wherein the notification presents an option to modify the policy.”

*Supra* claim 93; EX-1015 ¶¶599-600.

#### X. Claim 116

1. “... claim 91, wherein the notification presents an indication of a measure of usage of the wireless network associated with the service usage activity.”

Fadell’s notification 408 informs the user: “You are within 1% of exceeding the allocated data provider resources.” Fadell, Fig. 4. The consumer can set this range (“within 1%”). *Id.* ¶¶54, 51-52.

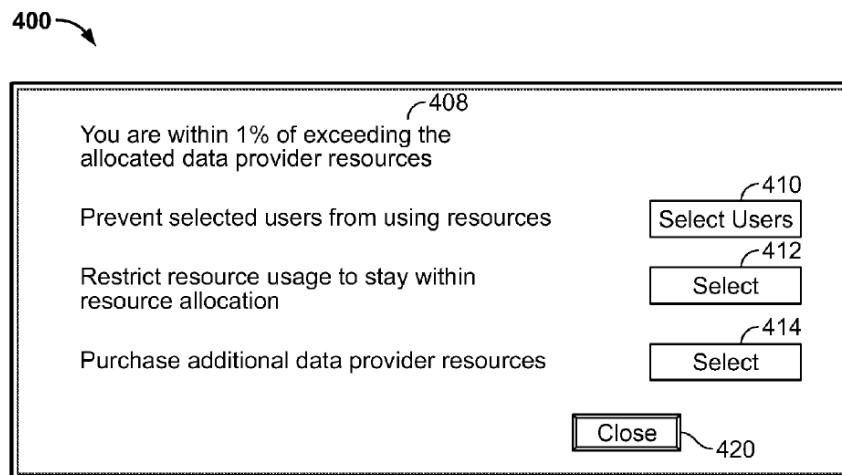


FIG. 4

*Id.*, Fig. 4.

Screen 400 gives the user options for responding to the notification, including restricting the amount of resources used, accepting a lower quality download, and exceeding the limit by purchasing additional resources. *Id.* ¶¶53, 56. Where a user chooses to exceed the limit, the consumer may only be allowed to exceed it by a particular amount before providing a new alert or displaying a new request for authorization or payment. *Id.* ¶53.

It would have been obvious to inform a user how much of their remaining resources would be consumed by a service usage activity (or how much the activity would cause them to exceed their resources), as Fadell teaches and suggests. EX-1015 ¶¶601-05; Fadell ¶¶53, 56. This would have allowed a user to make informed decisions, e.g., whether to reduce a data transfer size, by informing him/her of the resource cost for each option. EX-1015 ¶605; Fadell ¶¶53, 56.

Likewise, a POSITA would have been motivated to include these features in Rao-Fadell. EX-1015 ¶605; *see* claim 91 (describing benefits of Fadell's notifications). For example, Rao discloses determining "***characteristics or statistics*** of the application 338a-338n such as size, memory usage, total execution time, and/or frequency of use," Rao ¶188, and that its policies may be "specified in accordance to . . . the ***size of the payload*** of the network packet," *id.* ¶182. It would

have been obvious to provide in Fadell's screen 400 these determined characteristics or statistics of the application or the network packet. EX-1015 ¶605.

A POSITA would have been motivated to provide a measure of usage of the wireless network at or near limit because it would have provided users with information related to network usage, allowed a user to decide whether to allow the network packet from the queues, or modify the data plan to permit communication without an overage charge. *Id.* ¶606. This would have given a user greater control over the policy and provided users with additional information from which to decide how to implement the policy. *Id.*

#### **Y. Claim 117**

##### **1. “... claim 91, wherein the notification is provided through ...a window....”**

Fadell's screens 300-500 provide a notification through a window. Fadell ¶¶49-70, Figs. 3-5; *supra* claims 1, 91. A POSITA would have displayed Fadell's screens via the user interface of the end-user device in Rao-Fadell, been motivated to do so, and reasonably expected success in doing so. EX-1015 ¶¶607-08; *supra* claims 1, 91.

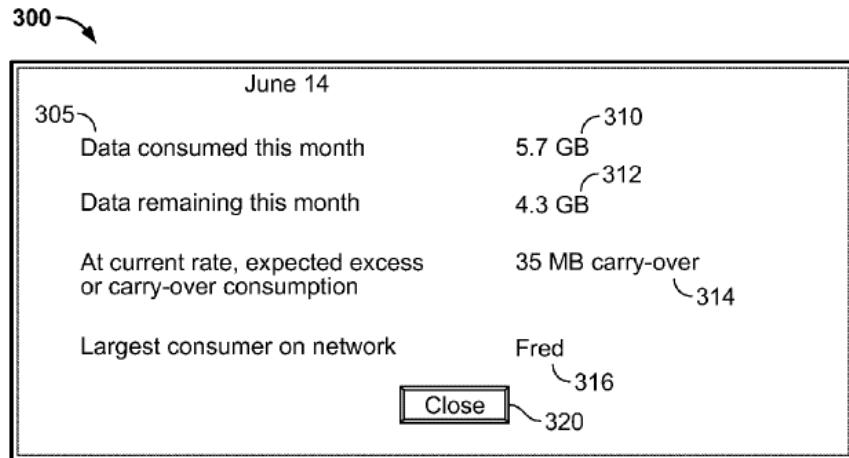


FIG. 3

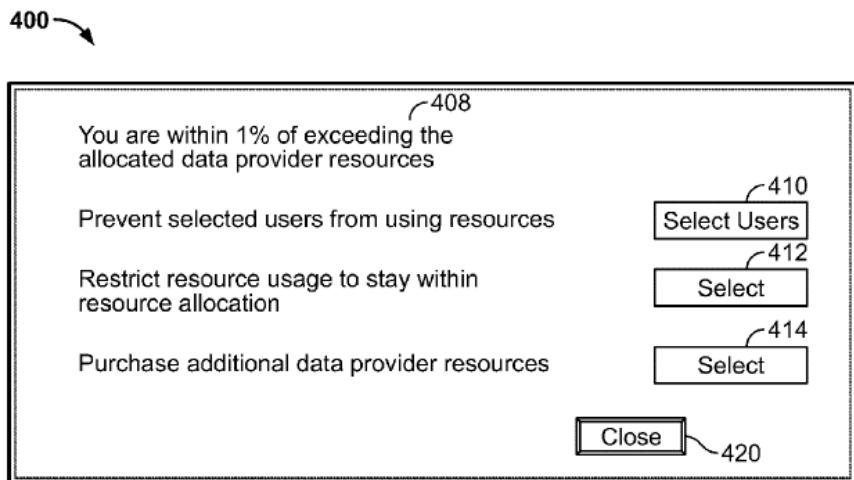


FIG. 4

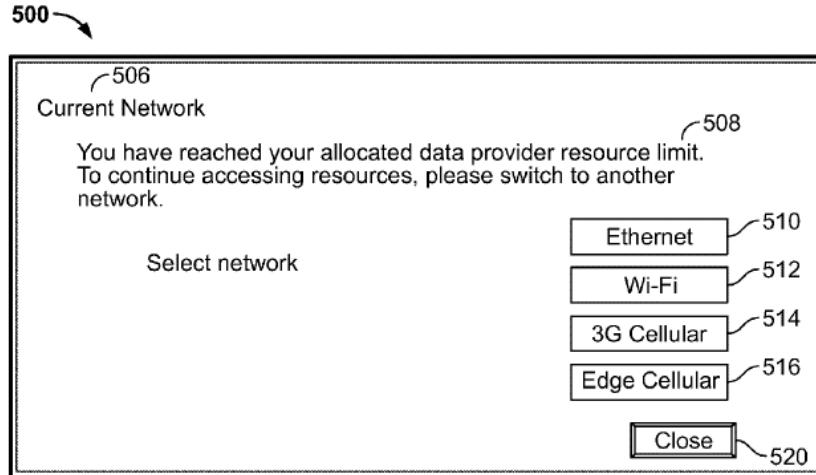


FIG. 5

Fadell, Figs. 3-5.

## Z. Claim 118

1. “... claim 1, wherein . . . the one or more processors . . . cause a notification to be presented through a user interface of the wireless end-user device.”

*Supra* claims 1, 91; EX-1015 ¶609.

## AA. Claim 119

1. “... claim 118, wherein the notification provides information about the policy.”

*Supra* claim 92; EX-1015 ¶¶610-14.

## BB. Claim 120

1. “... claim 118, wherein the notification provides information about an option to set, control, override, or modify the at least an aspect of the policy or a second aspect of the policy.”

*Supra* claim 93; EX-1015 ¶615.

### CC. Claim 121

1. “... claim 118, wherein the notification indicates that the service usage activity is the background activity.”

Rao-Fadell renders obvious claim 121. Rao-Fadell’s application may include, e.g., background email updates, auto-update processes, and virus program updates. Rao ¶¶179, 192; Fadell ¶¶60-61. It would have been obvious to provide a notification associated with these applications/processes in Rao-Fadell so the user is aware of the application/process and understands the associated service usage activity is background activity. EX-1015 ¶¶616-17.

It also would have been obvious to indicate in the notification, such as Fadell’s screens, that packets (service usage activity) associated with the application are being intercepted, queued, and assigned a priority because they are associated with background activity. *Id.* ¶618. A POSITA would have been motivated to do so because it would have informed the user of the system’s actions and identified which applications are being prioritized. *Id.* This would have given the user more information about, and control over, the system and policy. *Id.* For example, by knowing of background activity, the user can take action to override the policy to allow certain background activity. *Id.*

### DD. Claim 122

1. “... claim 118, wherein the notification provides information about a second network.”

*Supra* claim 103; EX-1015 ¶619.

**EE. Claim 123**

1. “...claim 118, ... obtain an indication of a user preference in response to the notification.”

*Supra* claim 105; EX-1015 ¶620.

**FF. Claim 124**

1. “...claim 123, wherein the indication of the user preference comprises a user directive to associate the policy with the first software component.”

Fadell’s screen 400 includes option 412 to restrict resource usage, including “based on the protocol or *application* requesting the data transfer.” Fadell ¶56, Fig. 4; *id.* ¶59 (limiting data requests “***based on the application***”). By receiving an indication to restrict resource usage based on a particular application via screen 400, Fadell discloses or renders obvious claim 124. EX-1015 ¶¶621-23.

A POSITA would have applied Fadell’s indication through screen 400 to restrict certain applications by applying the Rao-Fadell policy of intercepting, queuing, and defining a prioritization to network packets associated with the selected application in the same or similar manner as applied to background activity. *Id.* A POSITA would have been motivated to do so in view of Fadell’s teaching and suggestion. *Id.* ¶624; Fadell ¶¶49, 57-62, Fig. 4. This would have allowed a user to control implementation of the policy in Rao-Fadell and target applications, allowing the user to prevent data overages and associated charges caused by those applications. EX-1015 ¶624; Fadell ¶¶49, 51-52. For example, a user may

understand that particular applications consume considerable resources and wish to restrict their usage when at a resource usage limit/threshold. EX-1015 ¶624; Fadell ¶53.

#### **GG. Claim 125**

1. “**... claim 123, wherein the indication of the user preference comprises a user directive to restrict, allow, or block the service usage activity.”**

*Supra* claim 107; EX-1015 ¶625.

#### **HH. Claim 126**

1. “**... claim 123, wherein the indication of the user preference identifies a traffic control setting associated with the policy.”**

*Supra* claim 108; EX-1015 ¶626.

#### **II. Claim 127**

1. “**... claim 123, wherein the indication of the user preference comprises a user directive to override or modify the policy.”**

*Supra* claim 110; EX-1015 ¶627.

#### **JJ. Claim 128**

1. “**... claim 123, wherein the indication of the user preference comprises a user acknowledgment of the notification.”**

*Supra* claims 94, 123, 91; EX-1015 ¶¶628-29. Rao-Fadell teaches an indication of a user preference that is a “user acknowledgment” of a notification (e.g., claim 128) for the same reasons Rao-Fadell teaches obtaining an indication of a user *response* to a notification (e.g., claims 94, 123). EX-1015 ¶¶628-29. A

response to a notification is an acknowledgement of the notification or at least requires acknowledgement of it. *Id.*

#### KK. Claim 129

1. “... claim 123, wherein the indication of the user preference indicates one or more network types.”

Fadell’s screen 500 prompts a user and provides options to switch networks. *Supra* claims 103, 122; Fadell ¶¶63-70, Fig. 5. Fadell’s options “may identify networks by unique identifiers, such as by name (e.g., so that several networks of the same type, such as Wi-Fi, may be available for selection).” Fadell ¶63. Fadell’s options identify networks by type; therefore, a POSITA would have understood that the selection of a particular option (an indication of the user preference) indicates a network type. EX-1015 ¶¶630-31.

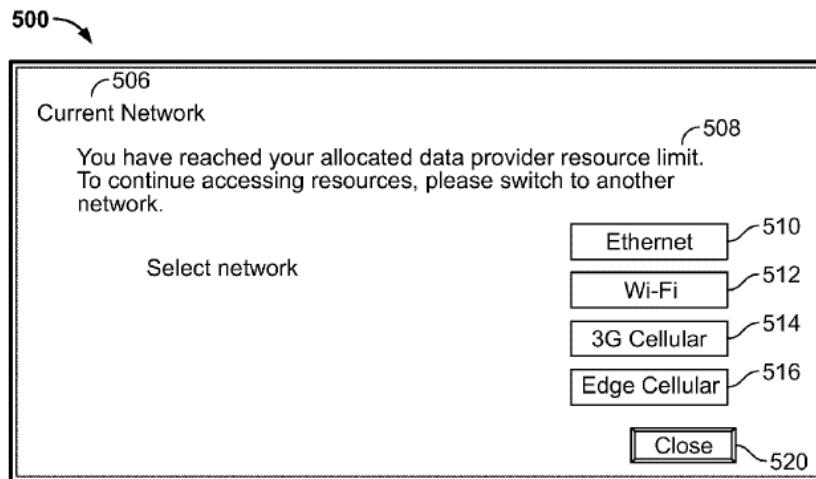


FIG. 5

Fadell, Fig. 5.

A POSITA would have been motivated to incorporate this aspect of Fadell in Rao-Fadell and would have had a reasonable expectation of success in doing so. *Supra* claims 103, 118; EX-1015 ¶632.

**LL. Claim 130**

1. “... claim 129, wherein the one or more network types comprise WiFi, 4G, 3G, wireless, wired, or a combination of these.”

*Supra* claims 103, 122, 129; Fadell, Fig. 5; EX-1015 ¶633.

**MM. Claim 131**

1. “... claim 118, ... cause the notification to be presented based on occurrence of a trigger.”

*Supra* claim 111; EX-1015 ¶634.

**NN. Claim 132**

1. “... claim 131, wherein the trigger is: a measure of the service usage activity satisfies a first condition relative to a threshold ...”

*Supra* claim 112, 91; EX-1015 ¶635.

**OO. Claim 133**

1. “... claim 118, wherein the notification enables a user ... to obtain information about at least an aspect of ... a service plan ....”

*Supra* claim 113; EX-1015 ¶636.

**PP. Claim 134**

1. **“... claim 118, wherein the notification presents a list of ... software components, the list of ... software components including ... the first software component.”**

*Supra* claim 114; EX-1015 ¶637.

**QQ. Claim 135**

1. **“... claim 118, wherein the notification presents information about a setting associated with the policy.”**

*Supra* claims 108, 105, 126; EX-1015 ¶638. By providing options to the user to restrict data usage and/or purchase additional resources, Fadell’s notification presents information about a setting associated with the policy. Fadell ¶¶56, 59-61, Fig. 4; *supra* claim 8; EX-1015 ¶638.

**RR. Claim 136**

1. **“... claim 118, wherein the notification presents information about the wireless network.”**

*Supra* claim 116; EX-1015 ¶639. Fadell’s screen 500 presents information about the current wireless network, such as “notification 508 indicating to the user that the allocated data provider resource limit for the current network (identified by indication 506).” Fadell ¶63, Fig. 5. Fadell’s screens 300-400 provide information about the wireless network, including data consumed and remaining, and an indication of the user being “within 1% of exceeding” a data resource limit. *Id.* ¶¶50-62, Figs. 3-4; EX-1015 ¶639.

**SS. Claim 137**

1. “...claim 118, wherein the notification presents an indication of a measure of usage of the wireless network associated with the service usage activity.”

*Supra* claim 116; EX-1015 ¶640.

**TT. Claim 138**

1. “...claim 118, wherein the notification presents information about ... a network availability state.”

By providing information about a second network (*supra* claim 103), Fadell’s notification presents information about a network availability state. EX-1015 ¶641. In Fadell, if “the limit for the current network has been reached, the resource utilization component may identify ***other networks available*** to the consumer for which allocated data provider resources remain.” Fadell ¶¶63-65, Fig. 5. This may include “identify[ing] a Wi-Fi or Ethernet network for which resources are ***available***,” “options for each ***identified available network***,” and “the amount of ***resources available*** for each network.” *Id.* ¶63, Fig. 5. This discloses information about a “network availability state.” EX-1015 ¶641.

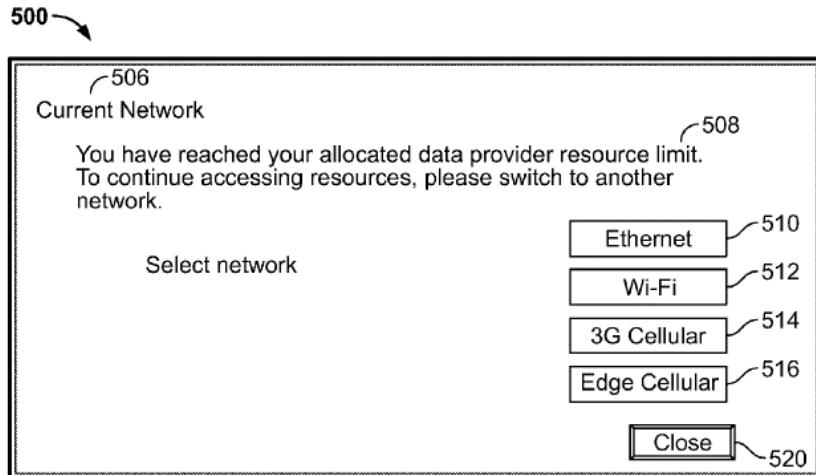


FIG. 5

Fadell, Fig. 5.

This corresponds with the '541 patent, which discloses techniques and/or policies based on “availability state for alternative networks.” EX-1001, 91:32-34, 71:19-23; EX-1015 ¶642.

#### UU. Claim 140

1.   **“... claim 118, wherein the notification presents information about a statistic associated with the service usage activity.”**

Fadell’s screens 300 and 400 present information related to the service usage activity’s contribution to a user’s data limit for a given period. Screen 300 provides “a notice of data provider resources used,” including data consumed and remaining, estimated data usage, and comparisons of estimated usage to the service plan. Fadell ¶¶50-53, Fig. 3. Screen 400 indicates that “the consumer has reached a [data] limit” or is within a percentage of exceeding it. *Id.* ¶¶54-62, Fig. 4. These provide

“statistic[s] associated with the service usage activity” because the usage activity contributes to the user’s data consumption information presented in Fadell’s notifications—information that a POSITA would have understood are statistics. EX-1015 ¶¶643-45.

Rao also determines “***characteristics or statistics*** of the application 338a-338n such as size, memory usage, total execution time, and/or frequency of use.” Rao ¶¶188, 182. It would have been obvious to provide in Fadell’s notification (e.g., screens 300-400) these determined application characteristics or statistics associated with a network packet intercepted by the system, as Fadell and Rao teach and suggest. EX-1015 ¶¶646-47. This would provide information about a statistic associated with the service usage activity. *Id.* A POSITA would have been motivated to include Fadell’s notifications, including screen 300-400, and provide via those notifications information about a statistic associated with the service usage activity, including Rao’s additional information. *Id.* ¶647; Rao ¶¶182, 188. This would have kept a user informed about applications associated with network packets, including their frequency of use and data requirements, before sending data over the network. EX-1015 ¶647. This would have furthered Fadell’s objectives of monitoring resource usage and preventing data overages. Fadell ¶49; EX-1015 ¶647.

It also would have been obvious to provide statistics in Fadell’s notifications about background activity initiated by incoming requests to the user device.

EX-1015 ¶648. Fadell discloses “log[ging] and quantify[ing] the number of unsolicited pings” to the user’s device. Fadell ¶66. Measuring this “ensure[s] that data transfers not initiated or requested by the consumer are not included in the measured data provider metering,” and not charged to the user. *Id.* Common background pings include tests for network connectivity and pings for location data. EX-1015 ¶648. Indicating to the user that a network packet, sent in response to a ping or incoming from the ping, would have benefited the user by preventing charges based on data requests the user did not initiate, as Fadell explains. *Id.*; Fadell ¶66. It would also allow the user to monitor and, if desired, terminate, background requests that cause frequent pings. EX-1015 ¶648. Providing such information, including a count or frequency of pings, provides information about a statistic associated with the service usage activity. *Id.*

#### VV. Claim 141

1.     **“... claim 118, wherein the notification comprises a gauge providing service usage information associated with the service usage activity.”**

Rao-Fadell discloses providing a notification of the user’s rate of consumption, the largest consumer on the network, or “other characteristics or statistics” associated with the service usage activity. *Supra* claim 140. It would have been obvious to present this information as a “gauge.” Fadell describes presenting information as a percentage. Fadell ¶54, Fig. 4; EX-1015 ¶¶649-51. As explained for

claim 140, a POSITA would have been motivated to better inform the user regarding their network use, as Rao and Fadell suggest. *Supra* claim 140; EX-1015 ¶¶650-51.

To the extent a “gauge” requires graphics, Fadell renders this obvious. EX-1015 ¶652. Fadell describes interfaces with the device’s current and/or historical service usage. *Id.* A POSITA would have recognized that how to present Rao-Fadell’s information was a design choice and would have been motivated to include a graphical representation for the same reasons a POSITA would have been motivated to provide a graphical representation of the information on screens 300-500, or other statistics to allow the user to easily review this information at-a-glance. *Id.* Providing the information Fadell recommends graphically, e.g., Fadell ¶50, Figs. 3-4, would have been straightforward and yielded expected results, EX-1015 ¶652.

### **WW. Claim 142**

- 1. “...claim 118, wherein the notification comprises a gauge providing service usage information associated with one or more networks, the one or more networks including the wireless network.”**

*Supra* claims 140-41; EX-1015 ¶654. The ’541 patent discloses that “a UI fuel gauge” may be displayed that includes network service usage “*relative to a service plan* for the device.” EX-1001, 73:65-74:2. Similarly, Fadell’s screens 300-500 provide a “gauge” providing service usage information associated with one or more networks, the one or more networks including the wireless network. *Supra* claim

141; Fadell ¶¶49-70, Figs. 3-5. A POSITA would have combined Fadell with Rao with a reasonable expectation of success and would have been motivated to make the combination as provided in claim 141. *Supra* claim 141. Fadell's disclosures also render claim 142 obvious. *Supra* claim 141; EX-1015 ¶¶653-58.

## **XX. Claim 143**

- 1. “... claim 118, wherein the notification comprises a gauge providing information associated with a service plan.”**

*Supra* claim 142; EX-1015 ¶659.

## **YY. Claim 144**

- 1. “... claim 118, wherein the notification is provided through... a window....”**

*Supra* claim 117; EX-1015 ¶660.

## **ZZ. Claim 145**

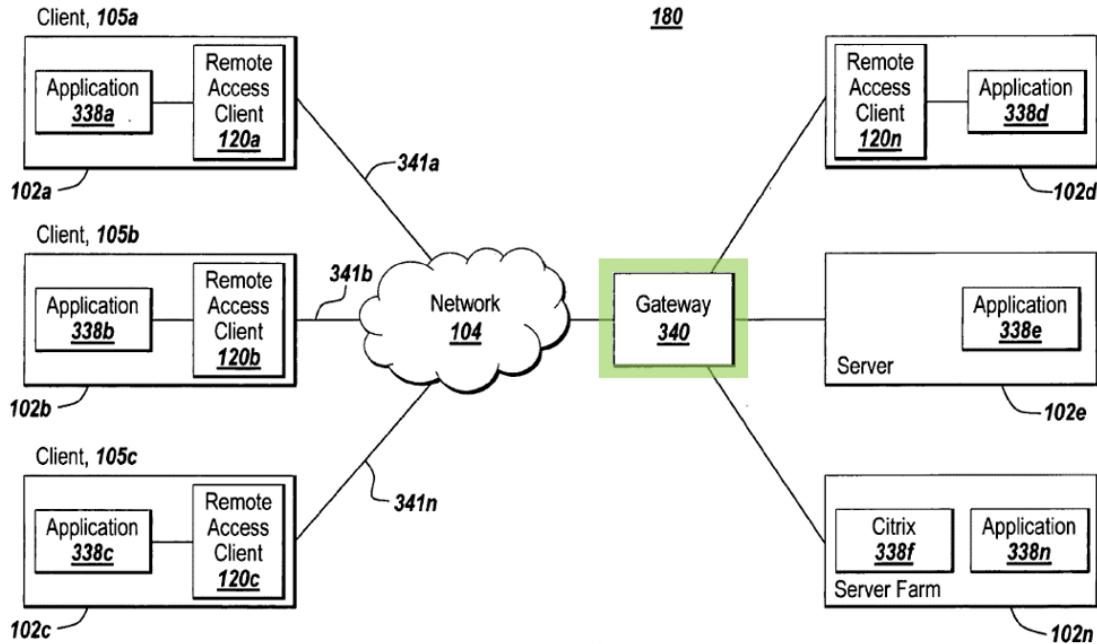
- 1. “... claim 118, wherein the notification comprises a warning or an alert.”**

*Supra* claim 95; EX-1015 ¶661.

## **AAA. Claim 146**

- 1. “... claim 118, wherein the information from the network element is first information, and wherein the notification is based on second information from the network element.”**

In Rao-Fadell, Rao's gateway 340 discloses a “network element,” and the information used to determine an aspect of a policy from the gateway may be “first information.” *Supra* [1e]-[1g], claim 118; Rao ¶¶183, 90-96, Fig. 1A; EX-1015 ¶¶662-63.



*Fig. 1A*

Rao, Fig. 1A (annotated).

Fadell further discloses a notification that may be based on information from a network element. EX-1015 ¶¶664-65; Fadell ¶50 (explaining that screen 300 notification provides “information related to the consumption of data provider resource” that is transmitted via “*a router or network component.*”), Fig. 3. This information regarding data consumption discloses “second information.” EX-1015 ¶665.

In Rao-Fadell, a POSITA would have been motivated to implement Rao’s gateway as the network element that provides both first information about the policy and a notification regarding data resource usage based on second information, as Fadell teaches and suggests. *Id.* ¶666; Fadell ¶50, Fig. 3. This would have benefited

users by notifying them of resource usage to avoid using more data than allotted. EX-1015 ¶666. Implementing Rao’s gateway to both provide information about the policy and notifications, as suggested by Rao and Fadell, would have been within a POSITA’s capabilities and a design choice. *Id.* Applying Fadell’s teachings to Rao’s gateway would have been combining known elements according to understood principles to yield predictable results. *Id.*

### **BBB. Claim 147**

- 1. “... claim 118, wherein the notification comprises information about a cost or a charge associated with the service usage activity.”**

Fadell’s notification “include[s] option 414 for purchasing additional data provider resources,” which requires “authorization to charge for additional resources.” Fadell ¶¶57, 63 (providing authorization via financial information, personal account pin or passcode, etc.).

Fadell’s option for purchasing additional resources, including authorization to charge for them, is information about a cost or a charge associated with the service usage activity. EX-1015 ¶¶667-71. An authorization charge would include information related to costs. *Id.* If claim 118 requires quantitative notification of the cost/charge, it would have been obvious from Rao-Fadell’s teachings to inform a customer of the cost/charge when selling the additional data. *Id.* A POSITA would

have been motivated to include such information in the notification to allow the user to purchase additional resources fully understanding the costs. *Id.*; Fadell ¶¶57-61.

A POSITA would have found it obvious to apply these teachings in Rao-Fadell to enable users to control their resource usage and understand the potential cost of continued post-threshold use. EX-1015 ¶672. This would have required only routine skill for a POSITA, who would have understood how to present notifications and offer the user options as Fadell suggests. *Id.*

### **CCC. Claim 148**

- 1. “...claim 118, wherein the notification comprises information about a service sponsor.”**

Fadell’s notification provides an option to change networks, and that notification identifies different networks by “unique identifiers,” such as by name. Fadell ¶63, Fig. 5. A POSITA would have understood that free, paid, and sponsored network access were common, and that network access may be sponsored. EX-1015 ¶¶673-75; EX-1013. For example, in exchange for viewing an ad, the user might receive free or reduced-cost network access. EX-1015 ¶675. Network access might also be contingent on, e.g., paying the service sponsor. *Id.*; EX-1012.

Fadell discloses including multiple networks of a type in the notification, Fadell ¶63, and it would have been beneficial to include information about each network (whether free, paid, or sponsored by a service sponsor) in the notification (e.g., using Fadell’s unique network identifiers) to allow an informed choice.

EX-1015 ¶676. Fadell also discloses that a user may have to pay for resources on a network. Fadell ¶¶53, 57. Accordingly, where a network offers sponsored access, a POSITA would have included information about the service sponsor (e.g., the sponsor's name or the cost charged by the sponsor) as part of the "unique identifier" suggested by Fadell. EX-1015 ¶676.

Alternatively, Fadell's "network administrator" is an exemplary "service sponsor" and discloses claim 148. *Id.* ¶677; Fadell ¶¶67-70. Fadell's network administrator "allocate[s] a particular amount of data provider resources to each user," and "monitor[s] the consumption and provide[s] . . . alerts to each of the devices or users." Fadell ¶¶67-69. For example, a network administrator who administers an employee network (e.g., local area network or Wi-Fi network) would pay a data provider for data and control use of the data on the network. EX-1015 ¶677. This is consistent with the '541 patent's description of a "sponsored service provider." EX-1001, 78:63-79:8, 80:48-62.

Fadell's screen 300 provides a notification that includes a "*a personal message from a network administrator to the consumer*" that "instruct[s]" the consumer "to cut back on resource use." Fadell ¶¶50, 69. A POSITA would have understood that this message discloses a notification that includes information "about a service sponsor," such as information about the network administrator's desire for consumer to reduce data usage. EX-1015 ¶678.

Fadell’s “network administrator may allow the user or device to exceed the allocated resources in exchange for an additional charge (e.g., a payment or penalty)” paid to “the data provider.” Fadell ¶70. The user pays by “*selecting an option agreeing to the penalty.*” *Id.* This is also a notification from a service sponsor that includes “information about a service sponsor,” including the penalty and who the user is paying. *Id.* ¶57, Fig. 4; EX-1015 ¶679.

A POSITA would have combined Fadell’s network administrator and its notifications into Rao-Fadell to alert users of the administrator’s directives to control data usage and permit reminders and overage/penalty payments. EX-1015 ¶680. A Doing so would allocate resources to different devices within the network, maximizing use of available data while reducing overages. *Id.*; Fadell ¶¶67-70.

#### **DDD. Claim 149**

- 1.     “... claim 1, ... detect an attempted use of the first software component; and ... cause a notification to be presented ....”**

Rao-Fadell renders obvious *continuing* to present notifications after an initial notification. *Supra* [1g]; Fadell ¶¶50-70, Figs. 3-5; EX-1015 ¶¶681-83. For example, if a data limit is reached and a background email update were deprioritized, and then the email client later attempted to retrieve email, it would have been obvious to monitor that attempt and again notify the user to determine how to proceed. EX-1015 ¶¶681-83. This discloses claim 149.

Detecting attempted uses and causing another notification would have been obvious based on Fadell's notifications and options for determining how to proceed near a limit or threshold. *Id.* ¶684. Screen 400 provides "selectable options" to restrict resource usage. Fadell ¶¶49, 52, 56, Fig. 4. Moreover, in Fadell, "data transfers may be restricted based on the protocol or application requesting the data transfer," *id.* ¶56, e.g., based on the software component, which detects attempted uses of those software components, EX-1015 ¶685. It would have been obvious to cause another notification on detection of an attempted use to inform the user of, e.g., "resources consumed for a tier subscription period," the expected consumption for a particular period, and/or expected penalties for data overages, as Fadell suggests. Fadell ¶¶49-50, 54-55, 63, Figs. 3-5; EX-1015 ¶686. This would have allowed the user to reschedule tasks or purchase additional resources, e.g., using option 414. Fadell ¶¶57-61; EX-1015 ¶686.

Doing so would have enabled users to better control their resource usage and stay within/below limits. EX-1015 ¶687. For example, having opted to restrict use of a particular application following an initial alert, a user seeking to use that application later would, on receiving the attempted-use notification, be able to instead reschedule, cancel, delay, slow down, enable, disable, and/or switch to other networks to run processes of "lesser importance," overriding the prior prioritization policy impact. Fadell ¶60; EX-1015 ¶687.

### **EEE. Claim 150**

- 2. “... claim 149, wherein the notification provides information to enable a user ... to override the policy.”**

Rao-Fadell teaches causing a notification to be presented when the user attempts to use the first software component and allowing the user to override their earlier application of the policy, e.g., by opting to exceed the allocated resources or purchasing additional resources to allow an otherwise-restricted application to operate. *Supra* claim 149; Fadell ¶¶ 53, 57; EX-1015 ¶¶688-89. Purchasing additional resources allows a user to override a previous resource limit, as the '541 patent confirms. EX-1001, 109:10-14; EX-1015 ¶689. A POSITA would have been motivated to include this option in Rao-Fadell and would have had a reasonable expectation of success in doing so. *Supra* claim 149; EX-1015 ¶690.

### **FFF. Claim 151**

- 3. “... claim 149, wherein the notification provides information about a cost or a charge associated with the service usage activity.”**

Rao-Fadell discloses notifications related to an attempt to use an application, *supra* claim 149, and its notifications may include information related to a cost or charge associated with using an application, *supra* claim 147; Fadell ¶¶57, 63; EX-1015 ¶¶691-95. A POSITA would have been motivated to include such information in the notification to allow the user to purchase additional resources

fully understanding the costs and would have expected success. *Supra* claims 147, 149; Fadell ¶¶57-61; EX-1015 ¶696.

**GGG. Claim 152**

4. **“... claim 149, wherein the notification provides information to enable a user ... to change or upgrade a service plan ....”**

*Supra* claims 104, 149, 150. Fadell discloses that the notification includes “option 414 for purchasing additional data provider resources,” which changes or upgrades the service plan. Fadell ¶57; EX-1015 ¶¶697-99. A POSITA would have been motivated to include option 414 in the notification. EX-1015 ¶700; *supra* claims 104, 149, 150.

**HHH. Claim 158**

1. **“... claim 1, wherein the user input ... specifies a user preference associated with the service usage activity or the first software component.”**

Rao-Fadell teaches claim 158. *Supra* [1e] (explaining users configure policies 520 using a user interface of the end-user device). The user input specifies a user preference that is associated with the service usage activity because the input defines how the user prefers to prioritize network packets (service usage activity). *Supra* [1e]; EX-1015 ¶725. For example, the user preference may specify active applications are processed ahead of background applications. Rao ¶3; Fadell ¶60, Fig. 4.

Rao-Fadell also teaches that the user input specifies a user preference associated with the service usage activity or the first software component for the reasons explained above in claims 107 and 109. *Supra* claims 107, 109; EX-1015 ¶¶726-28.

### **III. Claim 159**

- 1. “... claim 158, wherein the user preference comprises a preference to restrict, allow, block, delay, or throttle the service usage activity.”**

Rao-Fadell’s user input defines how the user prefers to restrict, allow, block, delay, or throttle the service usage activity. *Supra* claims 107, 108, 109, 110; EX-1015 ¶¶729-32.

## **VIII. Ground 2: Rao-Fadell-Freund Render Obvious Claims 97-98, 100-101, and 139**

### **A. Motivation to Combine**

The disclosures of Rao, Fadell, and Freund complement one another, and a POSITA would have combined them to produce a system that, when a resource usage limit/threshold is met, queues network packets and determines packets are associated with background activity using Freund’s method of determining whether application(s) are in user’s focus. EX-1015 ¶880; *supra* §VII.A, claim 1. Like Rao, Freund monitors network communications and distinguishes between foreground and background activity. Freund, 14:51-21:50, 8:63-9:3, 10:16-43. Freund discloses monitoring network activity on a “per process or per application basis.” *Id.*, 4:5-5:5,

4:51-63, 10:44-11:28. Freund also discloses warnings, such as “an error dialog,” a “redirecti[on] . . . to an error page,” or “an application error,” when an application is “not allowed to access the Internet.” *Id.*, 4:26-28, 5:61-64, 13:20-22, 26:52-58.

A POSITA would have incorporated Freund’s per application monitoring and associated warnings into Rao-Fadell. EX-1015 ¶884. As Freund discloses, doing so would have benefited system administrators measuring productivity (e.g., on an employer network or device). Freund, 8:63-9:3, 10:16-43. By monitoring application use, unproductive web browsing can be identified and minimized. *Id.* Specific applications can also be isolated and blocked. *Id.*, 4:26-28, 13:20-22, 26:52-58. This would have benefited both Rao and Fadell, for example, by monitoring applications that are background activity and/or consume significant bandwidth to assist intercepting the activity and notifying a user. EX-1015 ¶884.

A POSITA would have been motivated to incorporate Freund’s application-specific notifications into Rao-Fadell to provide user notifications when applications have launched/attempted to launch, thereby informing users what processes are consuming data and bandwidth. *Id.* ¶885. This would have enabled a user to act to modify usage to avoid data overages/charges. *Id.* Combining Freund’s application-specific monitoring and notifications with Rao-Fadell would have been simply the use of known techniques of application monitoring to improve similar methods (e.g., Rao’s packet prioritizing and Fadell’s notifications and resource monitoring) in the

same way. *Id.* The combination also would have been combining known prior art features according to understood principles to yield predictable results. *Id.* In doing so, the system would issue application-specific notifications to inform users of approaching resource usage limits and allow them to take appropriate actions. *Id.*

## B. Claim 97

1. **“... claim 91, ... first software component is at least a portion of an application, and ... the ... communications ... comprise an attempt to launch, run, or execute the application, and ... the notification comprises information about the attempt to launch, run, or execute the application.”**

Fadell discloses communications that comprise an attempt to launch, run, or execute an application. Specifically, Fadell discloses a web browser application and refraining from “automatically start[ing] playing back [of] video or audio” on a web page until the user instructs. Fadell ¶59. By offering the user the choice of whether to start playing back video/audio in Fadell’s web browser, Fadell discloses attempting to launch, run, or execute a software component that provides the video or audio. *Id.*; EX-1015 ¶¶887-89. Fadell also discloses restricting data transfers “based on the protocol or application,” Fadell ¶56, which discloses detecting attempted uses of software components, *supra* claim 147.

An application may also prompt other components to engage in background activity (e.g., automatic updates, virus scan updates, RSS feed detectors). EX-1015 ¶890; Fadell ¶¶56, 60; Rao ¶¶182, 188. A POSITA would have been motivated to

apply Fadell's teachings in Rao-Fadell to allow the user to decide whether to start such an attempt to launch/run/execute background activity. EX-1015 ¶890. This would have conserved resources and avoided unnecessary data expenditure. Fadell ¶59. A POSITA would have been motivated to do so to prevent software components from consuming data and bandwidth, potentially without the user's knowledge. EX-1015 ¶890; Fadell ¶¶56, 60; Rao ¶¶182, 188. This would have been no more than combining known elements according to understood principles to yield predictable results. EX-1015 ¶890.

Freund further discloses a client monitor that "can stop [an] application from accessing the Internet and/or warn the user" based on bandwidth or a resource threshold. Freund, 5:61-64, 30:10-28, 26:52-58, Fig. 7G.

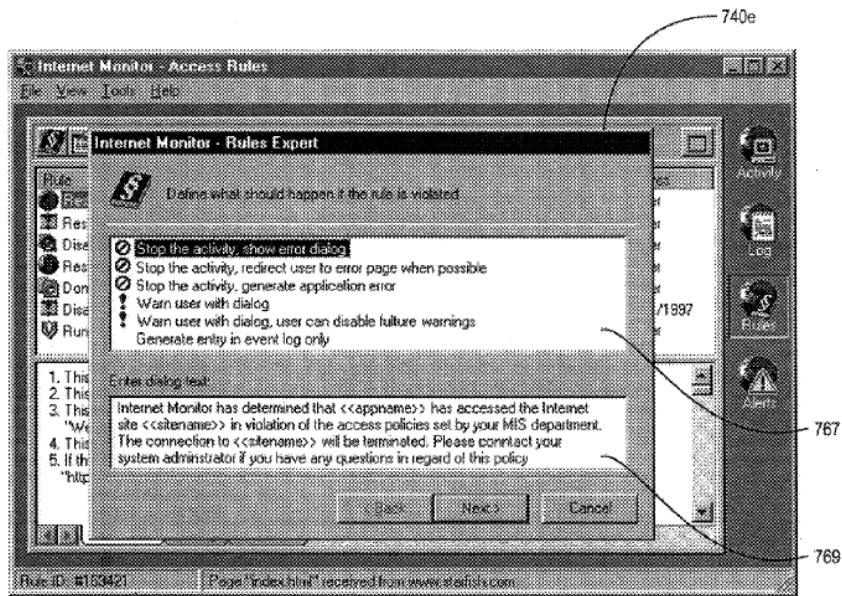


FIG. 7G

*Id.*, Fig. 7G (“warn user with dialog”); EX-1015 ¶891.

A POSITA would have understood that Freund’s warnings provide a notification that comprises information about the attempt to launch/run/execute the application. EX-1015 ¶892. A POSITA would have implemented Freund’s application-specific warnings to notify a user of system rules operating on a particular application. *Id.* ¶893. This would have allowed a user to understand what applications are being intercepted, queued, and prioritized, as suggested by Freund, Freund, 30:10-28, and provided the user greater control over the policy in the combined system (e.g., by prompting the user to redesignate the application’s priority). EX-1015 ¶893. A POSITA also would have recognized a security benefit of identifying applications attempting to launch/run/execute in the background, as Freund explains these may pose security concerns. Freund, 10:44-11:28; Fadell ¶66; EX-1015 ¶894.

### C. Claim 98

1. “**... claim 91, wherein the ... communications over the wireless network comprise an attempted or successful launch or execution of the first software component, and wherein the notification comprises information about the attempted or successful launch or execution . . .**”

*Supra* claim 97; EX-1015 ¶895.

**D. Claim 100**

- 1. [100a] “... claim 91, wherein the one or more prospective or successful communications ... comprise an attempt to download or load an application, and”**

Rao discloses applications running on client 105. Rao ¶88. Freund discloses similar applications, Freund, 15:12-18, 24:1-5, 29:60-66, including those “downloaded from the Internet,” *id.*, 10:66-11:1, 21:33-40, 29:50-51. A POSITA would have understood that attempts to download or load applications were common types of network activity, as taught by Freund, and accounted for in Rao-Fadell-Freund. EX-1015 ¶¶896-900. Rao confirms that wireless downloads were within a POSITA’s skill by explaining that both relevant policies and its remote access client may be downloaded onto wireless end-user devices over a wireless network. Rao ¶¶116, 183, 220. Accordingly, a POSITA would have understood that in Rao-Fadell-Freund, one or more prospective or successful communications over the wireless network may comprise an attempt to download/load an application. EX-1015 ¶900.

- 2. [100b] “wherein the notification comprises information about the attempted download or load of the application.”**

Freund discloses application-specific notifications when system rules are being applied to an application, and a POSITA would have been motivated to include these in Rao-Fadell-Freund. *Supra* claim 97. Likewise, a POSITA would have been motivated to warn the user when the policy is applied to a download/load of the application. *Supra* claim 97; EX-1015 ¶¶901-03. This is confirmed by Fadell, which

teaches media-heavy downloads may “require significant resources.” Fadell ¶¶18, 59. Alerting the user of an attempted download/load of an application would have allowed the user to reschedule or restrict the download to avoid over-use of resources and minimize costs. *Id.* ¶¶18, 60-61; EX-1015 ¶903.

#### E. Claim 101

1. **“... claim 91, wherein ... communications ... comprise an attempt to initiate usage of a cloud-based service or application, and wherein the notification comprises information about the attempted initiation ....”**

Rao-Fadell-Freund teaches communications comprising an attempt to initiate usage of an application and related notifications. *Supra* claim 97. Rao-Fadell-Freund further teaches usage that comprises a “cloud-based service or application” and renders obvious claim 101.

Rao discloses that its client 105 may connect to “a ***server farm*** 102e, . . . via a gateway 350,” which is a “logical group of one or more servers that are administered as a single entity” and “may be ***running one or more applications*** 338N.” Rao ¶¶86, 91. By disclosing a “server farm” that runs “one or more applications” that are remotely accessible over a network, Rao renders obvious a cloud-based service/application, which are remotely accessed services/applications run on multiple servers and remotely maintained for users to access. EX-1015 ¶¶904-07.

Usage of a remotely accessible (e.g., cloud-based) application would initiate via network communications, Rao ¶¶86, 91, and a POSITA would have been motivated to include notifications comprising information about that attempted initiation, as discussed with respect to Freund in claim 97, to offer the user the opportunity to decide whether to start that process, *supra* claim 97; EX-1015 ¶907.

#### F. Claim 139

1. **“... claim 118, wherein the notification presents an indication of a measure of usage of the wireless network associated with the first software component.”**

Rao-Fadell discloses a notification that indicates a measure of usage of the wireless network associated with a service usage activity. *Supra* claim 116. Rao-Fadell-Freund further discloses or renders obvious a notification that indicates a measure of usage associated with the first software component.

Freund discloses monitoring internet access on a per application basis, which provides “the ability to specify which applications can (and cannot) access the Internet.” *Supra* claim 1; Freund 9:63-10:1, 10:44-11:28, 25:20-51. Freund’s client monitor “can stop [the] application from accessing the Internet and/or warn the user” due to bandwidth concerns or user exceeding a resource threshold. Freund, 5:61-64, 30:10-28. Freund displays these warnings to the user. *Id.*, 26:52-58, Fig. 7G. Freund’s per-application monitoring simplifies the task of tracking bandwidth

utilization for a network, including providing detailed review of Internet access use.

*Id.*, 10:16-11:28; EX-1015 ¶¶908-13.

Based on Freund’s per-application teachings, a POSITA would have been motivated to notify the user (via a notification) not just the resource usage associated with a particular service usage activity, as Fadell teaches (*supra* claim 116), but the application associated with that activity, thus providing application-specific information. EX-1015 ¶914. Doing so would have enabled the system to “track[] bandwidth utilization” and “provid[e] [a] detailed review on how the Internet access is being used” based on applications requesting data. *Id.*; Freund, 10:44-11:28.

A POSITA would have applied Freund’s per-application monitoring in the combined system to inform the user how much data particular applications consume and provide the user more system information. EX-1015 ¶915. This would have enabled the user to take corrective actions, e.g., restricting particular applications/activities. *Id.*; Fadell ¶¶51-53, 58-61.

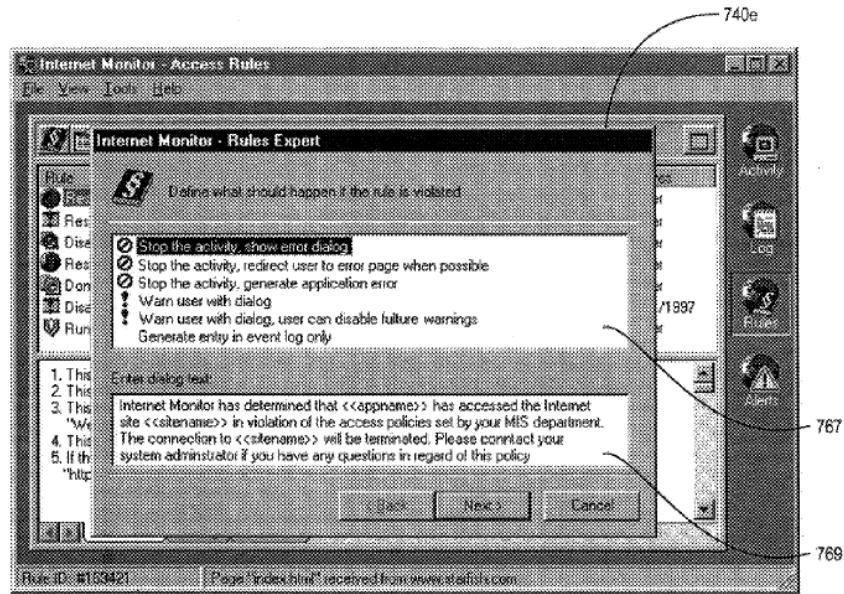


FIG. 7G

Freund, Fig. 7G. Applying Freund's per-application monitoring and associated warnings/dialogs in the combined system's notifications would have been nothing more than combining known elements according to understood principles for predictable results, EX-1015 ¶915.

## IX. 35 U.S.C. § 314

The Board should not deny institution under the *Fintiv* factors based on the Related Matters identified below. That Petitioner Google is not a party to the Related Matters favors institution under all factors, and particularly Factor 5. For all other Petitioners, the statuses of the Related Matters (Factors 1-4) are either neutral or favor institution.

Factor 1 is neutral. Factor 2 favors institution. The first trial in any Related Matter is May 19, 2025. Further, the trial date is not determinative particularly because, in EDTX, multiple trials are commonly scheduled on the same date.

Factor 3 favors institution. The first Markman hearing is not until November 19, 2024, and completion of discovery and dispositive motions all follow institution. EX-2018, 4. Petitioners diligently brought this challenge approximately 6 months after receiving contentions *for all 174 claims*. *CoolIT Sys., Inc. v. Asetek Danmark A/S*, IPR2021-01195, Paper 10 at 11-14 (PTAB Dec. 28, 2021).

Factor 4 favors institution. This Petition challenges 65 claims, which will likely be greater than the number of claims tried. EX-1017 ¶¶3-4. Moreover, Patent Owner asserts the patent in multiple litigations, and resolving invalidity questions here would mitigate duplicative efforts.

If Factor 6 is considered, the compelling merits of this petition outweigh any concerns that might arise under Factors 1-5. Petitioners rely on prior art that the Office never applied, present significantly different invalidity grounds, and rely on Dr. Wolfe's declaration explaining each claim's invalidity.

## X. 35 U.S.C. § 325

These grounds were not previously considered by the Office. Rao and Freund were not before the Examiner, and he did not discuss Fadell, which was submitted with over 700 references. After just one rejection, the independent claim was

rewritten, all 173 dependent claims were added, and the claims were allowed after a minor amendment with only a conclusory supporting rationale. EX-1015 ¶¶42-46.

## **XI. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8**

### **A. Real Party-in-Interest**

Google LLC,<sup>1</sup> Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group Inc., T-Mobile USA, Inc., Sprint LLC f/k/a Sprint Corp., AT&T Services, Inc., AT&T Mobility LLC, and AT&T Enterprises LLC<sup>2</sup> are the real parties-in-interest for this petition.<sup>3</sup>

---

<sup>1</sup> Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

<sup>2</sup> Related-Matter Defendant AT&T Corp. has undergone a corporate transaction and is now merged and converted into AT&T Enterprises, LLC.

<sup>3</sup> Defendant-Petitioners Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group Inc., T-Mobile USA, Inc., Sprint LLC f/k/a Sprint Corp., and AT&T Services, Inc. also acknowledge that each petitioner has a number of affiliates and state that no unnamed entity is funding, is controlling, or otherwise has an opportunity to control or direct this Petition or their participation in any resulting

## B. Related Matters

The '541 patent is, or has been, involved in the following proceedings:

| Name   | Number                     | Forum     | Filed         |
|--|----------------------------|-----------|---------------|
| <i>Headwater Research LLC v. Verizon Communications Inc.</i> | 2:23-cv-00352              | E.D. Tex. | Jul. 28, 2023 |
| <i>Headwater Research LLC v. AT&amp;T Inc.</i>               | 2:23-cv-00397              | E.D. Tex. | Sept. 1, 2023 |
| <i>Headwater Research LLC v. AT&amp;T Inc.</i>               | 2:23-cv-00398 <sup>4</sup> | E.D. Tex. | Sept. 1, 2023 |
| <i>Headwater Research LLC v. T-Mobile US, Inc.</i>           | 2:23-cv-00377 <sup>5</sup> | E.D. Tex. | Aug. 21, 2023 |
| <i>Headwater Research LLC v. T-Mobile US, Inc.</i>           | 2:23-cv-00379              | E.D. Tex. | Aug. 21, 2023 |

## C. Lead and Backup Counsel Information

Petitioners provide the following designation of counsel:

| Lead Counsel   | Back-Up Counsel  |
|--|--|
| Erika H. Arner (Reg. No. 57,540)<br>erika.arner@finnegan.com<br>Finnegan, Henderson, Farabow,<br>Garrett & Dunner, LLP | Daniel C. Tucker (Reg. No. 62,781)<br>daniel.tucker@finnegan.com<br>Alexander M. Boyer (Reg. No. 66,599)<br>alexander.boyer@finnegan.com |

---

IPR. Defendant-Petitioners Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group Inc., T-Mobile USA, Inc., Sprint LLC f/k/a Sprint Corp., and AT&T Services, Inc. are also not aware of any affiliate that would be barred from filing this Petition under 35 U.S.C. § 315(e).

<sup>4</sup> The -00398 case has been consolidated with the -00397 case.

<sup>5</sup> The -00377 case has been consolidated with the -00379 case.

|  |  |
|--|--|
| <p>1875 Explorer Street<br/>Suite 800<br/>Reston, VA 20190-6023<br/>Tel: 571-203-2700; Fax: 202-408-4400</p> | <p>Finnegan, Henderson, Farabow, Garrett &amp; Dunner, LLP<br/>1875 Explorer Street<br/>Suite 800<br/>Reston, VA 20190-6023<br/>Tel: 571-203-2700; Fax: 202-408-4400</p> <p>Cara E. Regan (Reg. No. 70,209)<br/><a href="mailto:cara.regan@finnegan.com">cara.regan@finnegan.com</a><br/>Finnegan, Henderson, Farabow, Garrett &amp; Dunner, LLP<br/>901 New York Ave. NW<br/>Washington DC, 20001<br/>Tel: 202-408-4000; Fax: 202-408-4400</p> <p>Patrick D. McPherson (Reg. No. 46,255)<br/><a href="mailto:PDMcPherson@duanemorris.com">PDMcPherson@duanemorris.com</a><br/>DUANE MORRIS LLP<br/>901 New York Ave. NW<br/>Suite 700 East<br/>Washington, DC 20001<br/>Tel: 202-776-7800; Fax: 202-776-7801</p> <p>Kevin P. Anderson (Reg. No. 43,471)<br/><a href="mailto:KPAAnderson@duanemorris.com">KPAAnderson@duanemorris.com</a><br/>DUANE MORRIS LLP<br/>901 New York Ave. NW<br/>Suite 700 East<br/>Washington, DC 20001<br/>Tel: 202-776-7800; Fax: 202-776-7801</p> |
|--|--|

In concurrently filed Powers of Attorney, Google LLC has granted Power of Attorney to Practitioners at Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, and Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group

Inc., T-Mobile USA, Inc., Sprint LLC f/k/a Sprint Corp., and AT&T Services, Inc.  
have granted Power of Attorney to Practitioners at Duane Morris LLP.

Petitioners consent to service by email at the addresses listed above and  
Headwater-541-IPRs@Finnegan.com, PDMcPherson@duanemorris.com, and  
KPAnderson@duanemorris.com.

## **XII. CONCLUSION**

Petitioners respectfully request that the Board grant IPR and find all  
challenged claims unpatentable.

Dated: June 7, 2024

By: Erika H. Arner/  
Erika H. Arner (Reg. No. 57,540)

**CERTIFICATE OF COMPLIANCE**

Pursuant to 37 C.F.R. § 42.24(a)(1)(i), the undersigned hereby certifies that the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,589,541 contains 13,999 words, excluding parts of this Petition exempted under § 42.24(a), as measured by the word-processing system used to prepare this paper.

Dated: June 7, 2024

/Daniel C. Tucker/  
Daniel C. Tucker (Reg. No. 62,781)  
Counsel for Petitioner

**CERTIFICATE OF SERVICE**

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a), the undersigned certifies that on June 7, 2024, a copy of the foregoing **Petition for *Inter Partes* Review, the associated powers of attorney, and Exhibits 1001-1018, and 1020-1022** were served by FedEx Priority Overnight on the correspondence address of record indicated in the Patent Office's public Patent Center system for U.S. Patent No. 8,589,541:

Dr. Greg Raleigh  
Headwater Research LLC  
110 North College Avenue, Suite 1116  
Tyler, TX 75702

Dated: June 7, 2024

By: William Esper  
William Esper  
Case Manager and PTAB Coordinator  
Finnegan, Henderson, Farabow,  
Garrett & Dunner, L.L.P